RAILROAD GAZETTE

FRIDAY, NOVEMBER 5.

Mogul Freight Locomotive.—Baltimore & Ohio Railroad.

The illustration, on the inset accompanying this number, which is taken from the enlarged edition of "Recent Locomotives" just published, represents a fine Mogul freight locomotive constructed by the Baltimore and Ohio Railroad at their shops at Mount Clare, Baltimore.

The following are the leading particulars of the engine:

Cylinders, diameter and stroke	19 in. × 24 in.
Drivers, diameter on tread	60 in.
Tractive force per lb. average pressure in cylinders	144.4 lbs.
Total weight on coupled wheels	87,400 lbs.
Tractive force, assuming average pressure in cylinders to be .85 boiler pressure	17,184 lbs.
Tractive force ÷ weight on coupled wheels	5.08
Boiler pressure	140 lbs
Boiler shell plates	⅝ in. steel.
Outside fire-box plates	⅝ in. steel, throat 7-16 in.
Inside " "	.5/16 in. steel, crown ⅜ in.
Flue-sheet, front	½ in. steel.
" back	½ in. steel.
Axles	Hammered iron.
Driving journals	7¾ in. × 8 in.
Crank-pins	Hammered iron. Main pin 5 in. × 4¾ in., 4½ in. × 5 in. Front and back, 3¼ in. × 3¼ in.
Piston-rods	Hammered iron, 3 in. diameter.
Pony-truck wheels	Cast iron.
" tires	Steel. 30 in. diameter.

The spark-arrester device is somewhat peculiar. No deflector-plate is employed, a perforated basket apparently serving the same purpose. This form of spark-arrester is, we understand, the invention of Mr. A. J. Cromwell, formerly Superintendent of Motive Power of the line, and is largely used on the Baltimore & Ohio.

The driving-wheels are of larger diameter than is usual on freight engines, and the engine has an ample amount of adhesion in proportion to the tractive force. Assuming that 119 lbs. per square inch is about the highest average pressure likely to be reached in the cylinders, the co-efficient of adhesion is about 1-5. In most American engines it is about ¼, and in some engines lately built for a Western road it is as low as 1-3.3. In all cases the average effective pressure on the pistons has been taken at 85-100 of the boiler pressure.

International Railway Exposition and Congress, Paris, 1887.

An International Exposition will be held in Paris, from May to October, 1887, when a railway jubilee will be solemnly celebrated.

This exposition will comprise the various industrial and professional branches connected with railways, such as engineering and mechanics, locomotives, machinery, passenger coaches and freight cars, hoisting and wrecking apparatus, apparatus for heating and lighting, apparatus for intercommunication, couplers and other railway appliances, building, furnishing and conveyance material, metallurgical and electrical apparatus, etc., etc., etc.

At the same time an International Railway Congress will be held by delegates from railway companies, chambers of commerce, scientific and professional societies, for the discussion of important questions of management, exploitation, maintenance, rolling stock, security, traffic, etc., etc.

Manufacturers and all others interested in the United States are earnestly invited to co-operate in order to secure such an exhibit as will enhance their prospects of foreign trade, and at the same time display the unexampled progress of their country.

JOHN W. WESTON,
Commissioner-General of the United States,
Nos. 230-236 La Salle street, Chicago.

The French Organization Committee, appointed to provide for the semi-centennial celebration, reports that it will consist of the following:

1. International Exposition of Railway Appliances and Industries.
2. International Railway Congress for the Discussion of Tariffs, Safety, Comfort, etc., etc.
3. Official Ceremony of the Opening of the Line, Paris-St. Germain.
4. Unveiling of a Statue to Marc Seguin and Railway Jubilee.

Georgia Railroad Commission.

The Railroad Commissioners of Georgia, Messrs. Campbell Wallace, L. N. Trammell and Alexander S. Irwin, have submitted the following annual report to the Governor of the state:

We have the honor to present the following statement of the operations of the Railroad Commission since the date of our last report.

So far as the action of the Commission is embraced in the circulars issued from time to time it can be readily understood by reference to the circulars which are hereto appended and which in each case shows on its face the object for which they were issued.

It will be seen that four new railroad companies, namely, Dublin & Wrightsville; Rome & Carrollton; Americus, Preston & Lumpkin and Buena Vista & Ellaville have applied to the Commissioners for a tariff of freight and passenger rates. These have been furnished and the roads are now operating under them.

Questions of much importance, involving sections of the act creating the Railroad Commission, have come before us and have been decided.

The first is the case of the Atlanta Chamber of Commerce against the Southern Railway & Steamship Association. The nature and character of this case, the ruling of the Commissioners therein and the grounds on which the ruling is based are fully set out in the decision which is hereto attached.

The next come the cases of John N. Dunn and Aaron Haas against the East Tennessee, Virginia & Georgia and the Western & Atlantic railroad companies. These cases involved a construction of section 5 of the Act creating the Commission, and particularly the proviso to that section.

In each of those cases the constitutionality of certain parts of that act was assailed. The Commissioners, however, restricted their decisions to a construction of the different sections of the act in question, and declined to consider or determine the constitutional objections made.

By the constitution of the state the duty of pronouncing upon the constitutionality of laws is entrusted to the Judiciary department of the government. In our view, the Commission is not a branch of the Judiciary of the state, but is a legislative agency created to perform certain legislative duties which can be more conveniently performed through that agency than is practicable by the direct action of the Legislature. This is the view of the character of the commission taken by our own Supreme Court and by Mr. Justice Woods in what is known as the Tilly case in the United States Circuit Court at Savannah.

In the cases of Dunn and Haas against the railroad companies, which were heard together, a demurrer was interposed upon the ground that it would be a violation of the provision of the federal constitution, which reserves to Congress the exclusive right to regulate commerce among the several states, for the Commission to take jurisdiction of the case and grant the relief prayed for, and by the Western & Atlantic Railroad Co. upon the further ground that that company, by virtue of its contract of lease with the state, is not subject to the operation of the law creating the Commission.

These demurrers were overruled in the decision which is appended to this report. The decision went no further. We had formulated no rule or circular on the subject, and had arrived at no decision on the merits of the cases.

The Western & Atlantic Railroad Co. then filed a bill against the Commissioners in the United Circuit Court for the Northern District of Georgia, containing substantially the grounds set out in its demurrer, and praying for an injunction against the Commissioners, restraining them from making a rule or order on the subject.

The application for injunction came on to be heard before Mr. Justice Woods of the Supreme Court of the United States, who held that the application for injunction was premature, and declined to grant the same.

He directed the bill, however, to be retained for the purpose of having the question adjudicated as to the jurisdiction of the Commission over that company under the allegations of the bill. The case is still pending in the Circuit Court, so far as we are informed.

On the argument in the first instance before the Commission, and afterwards before Justice Woods a decision of the Supreme Court of the State of Illinois in the case of the people of Illinois against the Wabash, St. Louis & Pacific Railroad Co. was relied on as showing the right of the Commission to entertain the cases made by Dunn and Haas and grant the relief they sought.

In the Illinois case it was alleged that the railroad company charged one party 15 cents per hundred pounds for transporting goods from Peoria, Ill., to New York city, and on the same day charged another party 25 cents per hundred for the same class of goods from Gilman, Ill., to New York, Gilman being 86 miles nearer than Peoria to New York, and that this constituted unjust discrimination, which was prohibited by the laws of that state.

The Illinois Court sustained the action, which was one of debt brought against the railroad company under the statute for unjust discrimination, holding that the act was not to be limited in its application to freights carried from one point to another wholly within the state, but may as well apply where the carriage is from a point within the state to a point without the state.

The Commissioners were informed that the Illinois case had been carried by the railroad company to the Supreme Court of the United States and had already been argued before that Court. Under these circumstances it was deemed proper to suspend all further action in the cases of Dunn and Haas until the Illinois case should be decided.

The decision of the Supreme Court of the United States has recently been pronounced and is adverse to the view taken by the Supreme Court of Illinois. The majority of the Court is reported to have decided that the Illinois statute, as applied to freights going out of the state, was a regulation of interstate commerce, which can only be appropriately made by general rules and principles which demand that it should be done by Congress under the commerce clause of the constitution.

Three members of the Court, including the Chief Justice, dissented from this opinion, and are reported to have held that in the absence of legislation by Congress on the subject the states could legislate thereon.

We have not seen the text of the decision. It is to be hoped that it will go far toward determining many difficult and perplexing questions now arising in the different states of the union as to the power and limits of state authority on such subjects.

It is to be regretted that on a question of so great importance and such general interest that high tribunal should be divided in opinion.

The failure of Congress so far to legislate on this subject will, under the decision of the Supreme Court, practically leave the citizens of the country, in many instances, subject to unreasonable changes and unjust discriminations for which no remedy is provided by law.

Circular number 48, issued by the Commission in May, 1884, prescribed that a charge of no more than $2 per car would be allowed for switching or transferring cars from any point on any road to any connecting road or warehouse within a space of three miles from the starting point.

It was claimed by some of the railroads that the words "per car" used in the circular meant a car-load of 20,000 pounds, and that when a car weighed more than 20,000 pounds the road could charge for the excess in the same proportion for this service. The matter came before the Commission on complaint made, and we decided that under the circular referred to no more than $2 per car, without regard to weight or contents, could be charged.

A revision of the Commissioners' classification has become necessary in order to embrace many articles that are not now included therein, as well as to note changes that have been made in the classification of certain articles since the original classification was made. The Commissioners are now engaged on this work.

Matters are frequently brought to our attention by parties in different parts of the state over which we have no jurisdiction, and many requests come to us for information on subjects supposed to be within our knowledge relating to railroads. The information is promptly given if in our power, and when we cannot take cognizance of the subject matter of applications we refer the party to what we consider the proper quarter to apply for relief.

The operations of the Commission while affording, as we believe, reasonable satisfaction to the people, have not in our judgment worked injury or injustice to the railroads. The reports of the different companies recently made to this office of their operations for the past year, notwithstanding the general depression that affects the prosperity of the country show in almost every instance a striking increase in their business and earnings.

With a view of obtaining reliable information as to the railroads now being constructed in the state, the Commission issued circular No. 77, calling upon all railroads doing business in the state, and all companies having railroads under construction to make quarterly reports to the Commission, the first to be filed by Oct. 10, 1886, showing number of miles of track laid during the quarter and number of miles graded and number and length of sidetracks laid during the same time. New companies were requested to report the number of miles of track laid and number of miles graded previous to the time of making their first report. This circular has met with but a partial response from the railroad companies. Enough information, however, has been obtained to warrant the belief that perhaps as many miles have been constructed within the past year as ever before in the history of the state. About 200 miles of track has been laid, and the incomplete reports we have show that more than 100 miles have been graded upon which the track has not been laid. Several other lines of magnitude and importance have been projected, and seem in a fair way of being pushed to successful completion.

The General Assembly of the state by the act of Sept. 27, 1883, amendatory of the act creating the Railroad Commission, provided that not more than 50 cents per square of usual advertising space, when less than a column was occupied, or more than $12 per column when as much space as a column or more is occupied, should be charged by the newspapers doing the work for the publication of the schedules established by the Commission, or any changes or revisions of such schedules. The law designates the cities of the state where this publication shall be made.

The newspapers in the places designated claim, and we think justly, that the amount allowed by law is inadequate compensation for this service.

We respectfully recommend that $1 per square be allowed for these publications when space less than a column is occupied, and $20 per column when that much or more space is occupied.

The appropriation allowed by law to the Commission for office rent, furniture, stationery and printing is inadequate. With the closest economy we have been unable to keep our expenses within the appropriation. The office is in need of an iron safe in which to keep records and valuable papers pertaining to its business.

We respectfully request also that a sufficient appropriation, say $100, be made to have printed a railroad map of the state. A map of this kind was prepared when the Commission was established, but so many new lines have been built since that time that it is now practically worthless.

We have daily application from the people of the state for copies of the act creating the Commission, for our reports, circulars and tariffs.

Similar applications come from the different states of the union and from England and Germany. In many instances we have been unable to furnish the documents requested.

We renew the recommendations made in previous reports for an increase of salary for the Secretary of the Commission. We respectfully urge that it be placed at $1,800. From the character of the duties devolving upon the Secretary, and the skill and experience requisite for their efficient performance, we consider the amount recommended extremely reasonable.

In conclusion, we have to say that it affords us pleasure to note the harmonious relations now existing between the railroad companies and the people of the state. Complaints of substantial grievances are comparatively rare, and in many cases satisfactory adjustments are arrived at by the parties themselves. When adjustments have not been reached, and we have been called upon to investigate the subject of difference and decide it, our decision has been cheerfully acquiesced in, and in the main has been apparently satisfactory to both parties.

German Practice in Ballast for Railroads.

An abstract of some foreign papers published by the British Institute of Civil Engineers says:

As a result of experience with iron sleepers, increased attention has of late been given to the condition of the ballast. Lengths of ballast of medium quality, in which wooden sleepers appeared to be dry, have proved unsatisfactory with iron sleepers. By means of their pumping action the latter draw the wet up from below and work the ballast up into mud, making a solid bed impossible. This working up into mud occurs also with wooden sleepers, but only after the ballast, having become perfectly impermeable for water, requires renewing.

The reasons for this difference may be stated as follows:

1. The iron sleeper has twice the deflection of the wooden one.
2. On account of the accurate fastening of the rail to the iron sleeper it shares the whole vertical motion of the rail, whereas with wooden sleepers the play of the foot of the rail in the dogs, and the compressibility of the timber, both tend to lessen the deflection of the sleeper.
3. The hollow body of the iron sleeper is very favorable to the formation of an air-tight cavity, inducing the pumping action above referred to.
4. The under surface of the wooden sleeper lies twice as deep as that of the iron one.

The working up of the ballast into mud by iron sleepers on certain trial lengths has interfered with their more general introduction, whereas the failure should have been put down to the inferiority of the ballast and its impermeability to water. It would be found that in similar ballast there is wet at the bottom of wooden sleepers. These considerations lead to the question—Is enough attention given in Germany to the nature of ballast in the construction and maintenance of railways?

The free-lying ballast introduced by Stephenson on English railways is now the universal rule in Germany, the old German system ("Koffer system"), or curved-surface system, being entirely superseded; but not only in the form, but also as to the material of the ballast, the English chose right at first.

Very little broken stone is used for ballasting German railways, as is shown by the prices of ballast as taken from "Statistics of the Railways of Germany," and given in the following table:

Date.	Price per cubic yard, in cents. Average.	Maximum.	Minimum.
1881-2	34	112	6
1882-3	34½	100	5¼
1883-4	34	120	6

The bulk of the prices range between 18 and 30½ cts. per cu. yd.; this shows that there cannot be much broken stone used, the bulk of the ballast used being land and river gravel, sand or cinders. The advantages of the use of broken stone ballast are not as yet appreciated in Germany, the ballast material being chosen on account of cheapness in first cost. The author considers that broken stone is to be preferred to gravel in all cases. Good ballast must fulfill the two following conditions:

1. It must be capable of being beaten up under the sleeper into a firm mass, so as to afford the greatest possible resistance to the deflection when the load comes upon the sleeper, and also the greatest possible resistance to shaking loose.
2. At the same time the material must be such that between the sleepers there may be among it interstices for the passage of water, but also the greatest possible cohesion and friction to prevent slipping and to distribute equally the pressure of the load.

Broken stone fulfills the conditions in a much higher degree than gravel. There is much more friction between the various angular fragments of the broken stone than between the round pebbles of gravel, and on this account the broken stone when once beaten up retains its place better than the gravel,

Fig. 1.

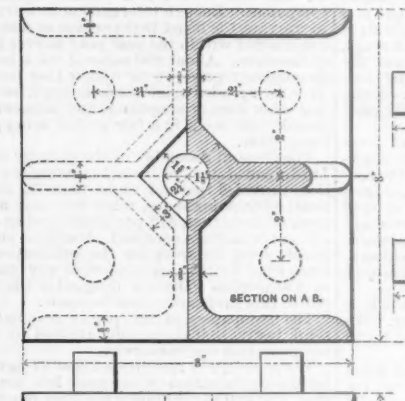
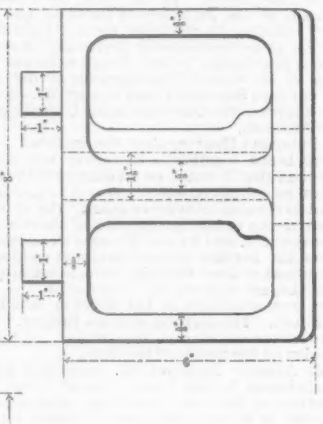
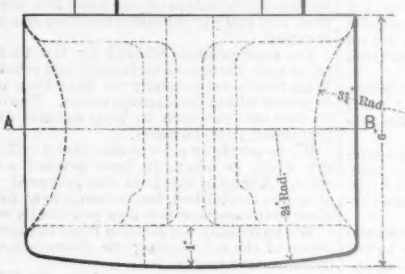


Fig. 2.

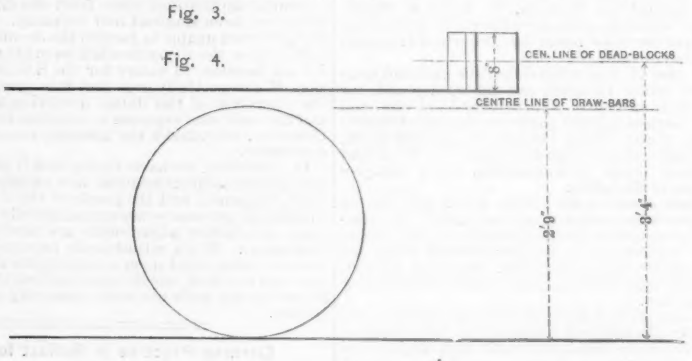




STANDARD CASTING FOR DOUBLE DEAD-BLOCKS.

Fig. 3.

Fig. 4.



STANDARD DIMENSIONS FOR DOUBLE DEAD BLOCKS.

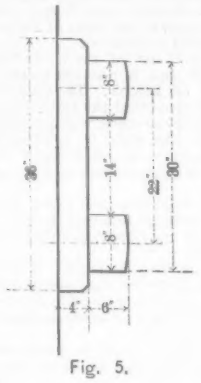


Fig. 5.

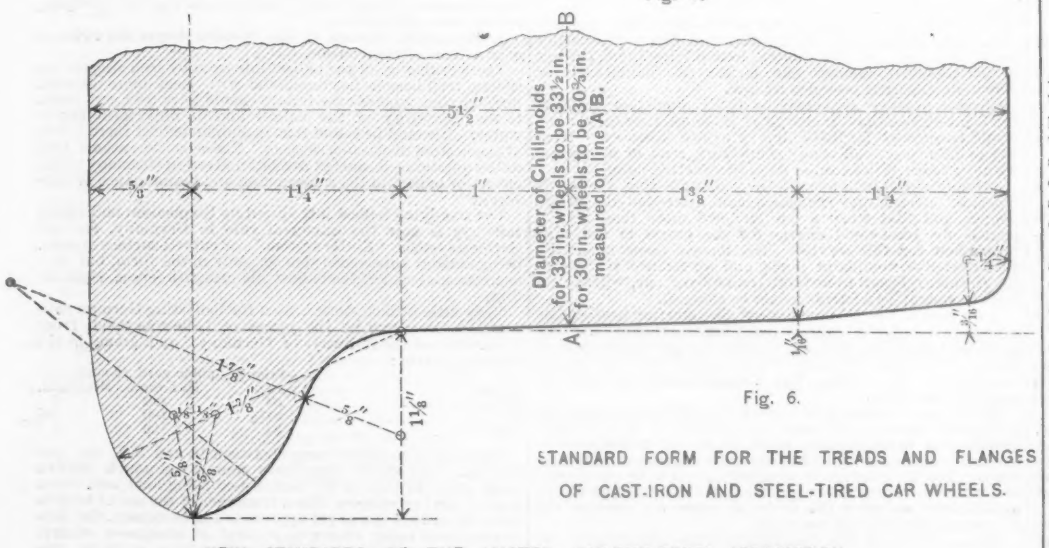


Fig. 6.

STANDARD FORM FOR THE TREADS AND FLANGES OF CAST-IRON AND STEEL-TIRED CAR WHEELS.

NEW STANDARDS OF THE MASTER CAR-BUILDERS' ASSOCIATION.

which constantly shakes loose. No doubt a firm bed for the sleeper is more easily obtained in the first instance with gravel, as the small stones and sand fill up the interstices between the larger stones; but this is far outweighed by the great advantage of the superior drainage resulting from the use of broken stone.

It is usual in Germany for the ballast to be laid to not more than 10 in. below the under-side of the sleepers. With gravel ballast this is too little, as, owing to capillary attraction, the water stands in the gravel, and also drains off very slowly. The depth should be 12 in. to 14 in. below the bottom of the sleeper, according to the nature of the formation. Usually no attention is paid to this, the thickness of ballast being uniform throughout, whereas the line stands much better when the formation is permeable than when it is not, however excellent the drainage may be.

The author considers that instead of the ballast being renewed when the line is relaid, as is now usually the case, the lower portion of it being then choked with fine matter and impermeable, it should be kept constantly clean by being from time to time opened out and screened, the fine matter being removed and the coarse replaced, the deficiency being made up of new material. This method would be more in accordance than is the present with the principle that ought to guide permanent way maintenance—namely, that every part of the permanent way must always be kept in a condition answering to its function, the maintenance being prospective and continuous.

New Standards Adopted by the Master Car-Builders' Association.

The following action in relation to standards has recently been had by this Association, as announced by circular of the Secretary :

The dimensions and form of castings for double dead-blocks shown in figs. 1 to 3 WAS ADOPTED AS A STANDARD by an affirmative letter ballot of 381 to 119, being over two-thirds.

The dimensions of beams for double dead-blocks shown in figs. 4–5 WAS ALSO ADOPTED AS A STANDARD, by an affirmative vote of 375 to 126, being over two-thirds.

The proposed height of 34½ in. (2 ft. 10½ in.) in place of the present standard of 33 in. (2 ft. 9 in), for the standard height of passenger draw-bars from top of rail to centre of hook, WAS REJECTED as a standard, by a vote of 246 affirmative to 276 negative.

The form of wheel-tread shown in fig. 6, being substantially that which was rejected last year except that the central portion, which was formerly cylindrical, has been given a coning of $\frac{1}{10}$ in. [as was suggested in the *Railroad Gazette* at the time] WAS ADOPTED AS A STANDARD, by the large affirmative vote of 411 to 91.

The Christie brake shoe was likewise ADOPTED AS A STANDARD by an affirmative vote of 369 to 130.

It is also announced that the Executive Committee reached the following conclusions in various matters, at a meeting held Sept. 16, 1886 :

AUTOMATIC COUPLERS.

The following resolution was adopted by the Committee : "That hereafter the Executive Committee will not examine into the merits of any car-coupler unless it has been put into practical use, and the inventor of it, or the owners of the patents, sign a written statement that they believe it to be as near perfect as they know how to make it, and then get five members of the Association to certify that they believe the coupler is a practicable one, with a recommendation that the executive committee investigate its merits."

WHEEL-DEFECT GAUGE.

A resolution was adopted recommending "that, at the next convention of the Association, the radius of the curve for the throat of the flange of the wheel-defect gauge [illustrated in the *Railroad Gazette* of May 21, 1886] should be made $\frac{3}{16}$ in. instead of $\frac{5}{8}$ in., and the Committee also recommended that railroad companies make this change now."

BRAKE TRIAL FUND.

The Secretary reported that he had received $25 from each of the 14 following companies to defray the expenses of the brake trials made at Burlington, Iowa: Pennsylvania; Boston & Albany; Atchison, Topeka & Santa Fe; Chicago, Milwaukee & St. Paul; Northern Pacific; Louisville & Nashville; Chicago & Northwestern; Cleveland, Col., Cin. & Ind.; Illinois Central; New York, Lake Erie & Western; Pittsburgh; Cincinnati & St. Louis; Grand Trunk; Baltimore & Ohio; Union Pacific; a total of $350.

A resolution was adopted instructing the sub-committee, which was appointed at Niagara Falls, to raise funds to defray the expense of the brake trials, and to solicit railroad companies to contribute the money required, which is $500, to publish the Brake Committee's report.

AMENDMENTS TO THE RULES OF INTERCHANGE.

The Secretary was instructed to send a circular to the members of the Association, requesting them to suggest to the Executive Committee any amendments or changes to the rules of interchange which the members may think are required.

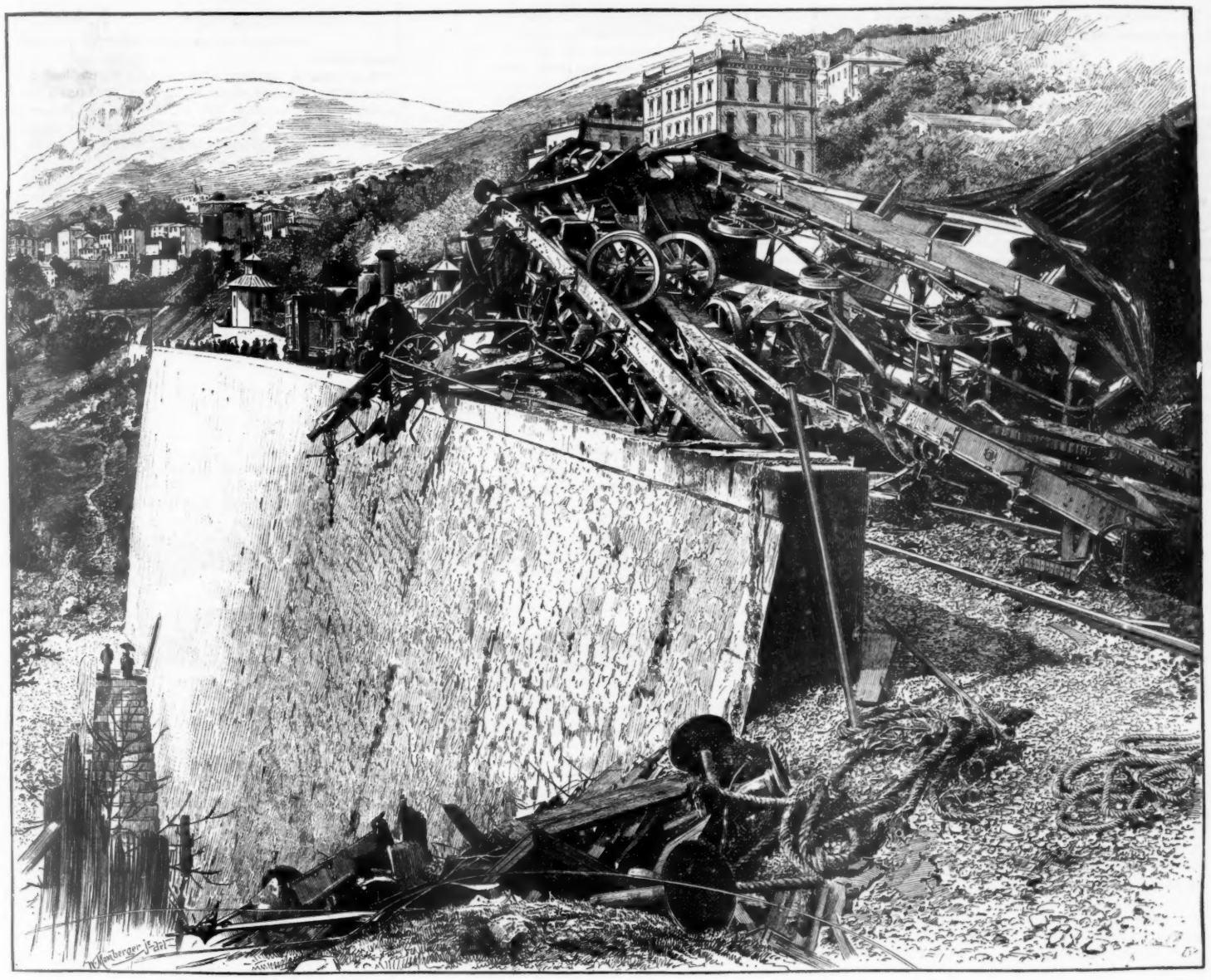
The Monte Carlo Disaster.

In connection with the engravings of the consequences to American rolling stock of the Silver Creek disaster, which we published Sept. 24, the view of the consequences to European rolling stock of similar collisions is interesting and—if we may say so of such a subject—gratifying. The speed was somewhat higher, but not enough so to make a very material difference in the comparison, and at any working speed such a heterogeneous heap of material which has lost all semblance of its original form is all but impossible here.

The Monte Carlo disaster happened between that station and Mentone, in Italy, March 10, 1886. It was not a particularly fatal one, the reports showing that four were killed and 23 injured, about half of whom afterward died. It was notable as one of the few collisions which occur within full view of a crowd of people who know that it must occur and are watching for it. From our description published April 2, 1886, we extract the following :

"The line skirts the sea coast, curving along the steep sides of lofty cliffs. [Some one signaled the train ahead without authority of the station-master.] The unfortunate station-master pressed his head as in a vice with both his hands and became livid. In an instant, the crowd of passengers was aware of the danger which threatened the train. The entire curve of the line between Monte Carlo and Cape St. Martin was under the eyes of the spectators. There were three trains in that section. One, which was not in danger, was entering the St. Martin tunnel. The other had just left Roquebrune, and was steaming up at full speed toward the one which had left the station.

"It is impossible to give an adequate idea of the anxiety of the 500 spectators. At first it was hoped that the engine-runners would perceive each other's trains in time, as the inside of the curve sloped downward toward the coast. All the bells of the station were set ringing. Still the two trains of smoke were getting nearer and nearer to one another. At last the engine driver of the train coming from Mentone saw the other and put the brake on, but the latter, being on the wrong side of the curve, saw nothing. Two hundred yards! a hundred yards! ten yards! A fearful cry of anguish was raised by the crowd. The women turned away their faces. A young girl swooned. We heard the shock and saw the two trains rearing upon one another. Two or three carriages were thrown over the rocks into the sea. Then



THE MONTE CARLO DISASTER.

arose a thick smoke that veiled everything. The station-master seemed as if he had gone out of his mind, and the people rushed out of the station in all directions, wildly calling for help."

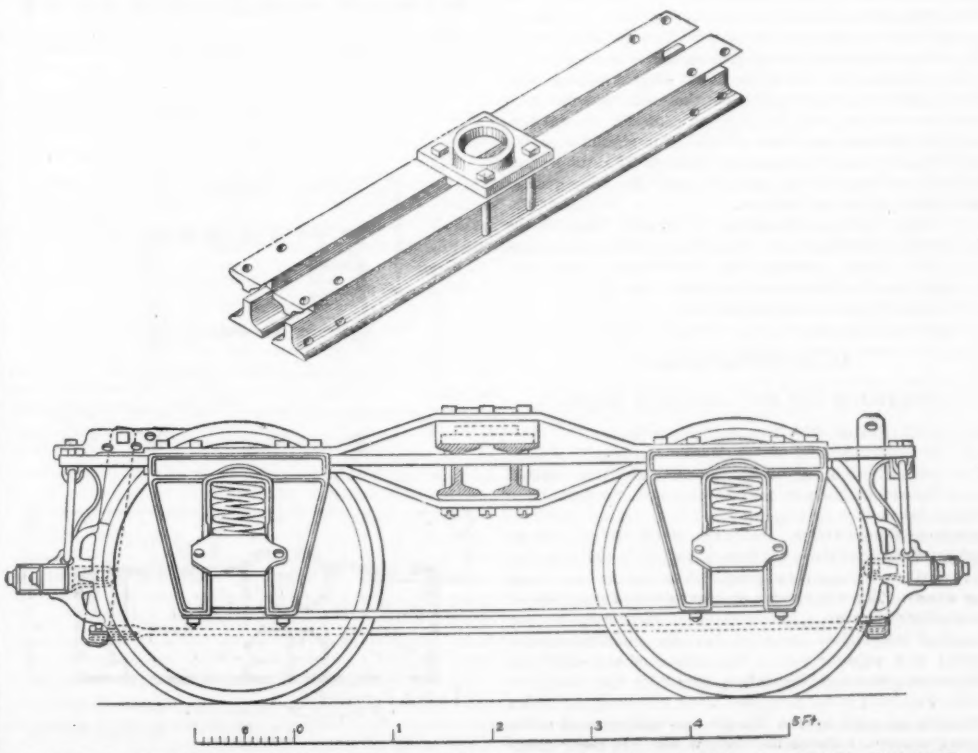
In another respect the view we publish is interesting; in the side-light which it throws upon the question of the comparative cost of American and foreign railroads; to what extent the greater cost of the latter has been for value received in more solid or more economically operated railroads, and to what extent it has been for works of unnecessary massiveness and cost, which could have been avoided by more judicious location, and return but the merest fraction of a reasonable interest on their cost, either in money or in increased safety. It will be seen by every engineer that, whatever may have been the character of the line just before it becomes visible in the foreground, an American road would very certainly never have built the massive retaining wall in the foreground nor the other just beyond, but would have saved both by swinging the line in a few feet at the cost of a slight addition to the curvature and possibly to adjacent cuts, but effecting in the aggregate a large saving. This subject, however, we can better discuss later in connection with another engraving, smaller in size, but even clearer in its moral.

Standard Freight-Car Truck and Bolster, Boston & Albany Railroad.

The Boston & Albany standard truck, which is now well known as differing markedly in type from most others in use, and which is generally admitted to have many good points, has been recently modified by substituting the iron bolster shown in the accompanying engraving for the wooden bolster heretofore in use. Nothing more is now needed than to substitute iron for wooden brake-beams to make the truck entirely iron.

About 100 pairs of these trucks have been so far built, and about 30 pairs per month are now building. They cost (with good wheels) about $300 per pair, which is not materially different from the estimated cost of the proposed new standard truck, but, perhaps, a trifle more.

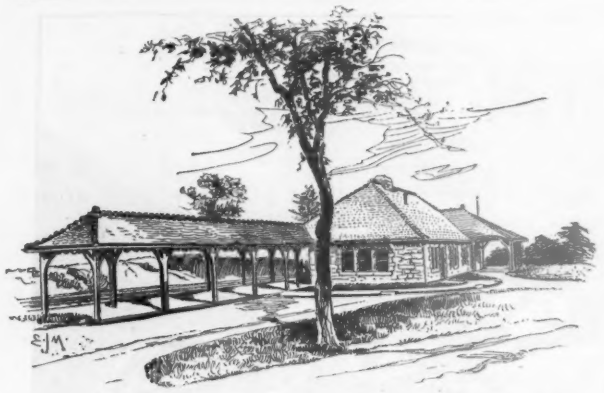
The first pair built with the new bolster was put under a car for shop use, loaded with over 34 tons of scrap, and sent to Springfield, about 100 miles. The deflection was not perceptible in any part, and not a bearing got hot, which showed clearly that the truck was good for at least that load, and we learn that it is considered good for 40 tons. The springs of the truck, which are sometimes made an objection to it, give no trouble, we are informed, and their cost is not in excess of other freight car springs, while they have the obvious and great advantage that the weight of the truck frame itself, instead of the car body only, is carried over them, which should make an appreciable difference in the wear and tear, other things being equal. The certainty that the truck must continue square, and the ease of hanging on the brake-beams are other advantages. So far, the truck has certainly made a good record for itself, and it has now been in use on many thousand cars for many years.



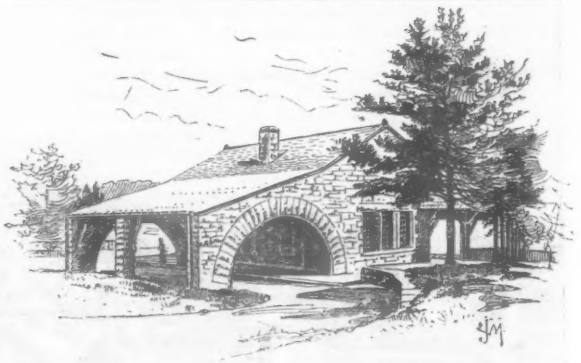
STANDARD CONTINUOUS FRAME TRUCK WITH IRON BOLSTER—BOSTON & ALBANY RAILROAD.

Station Buildings by H. H. Richardson.

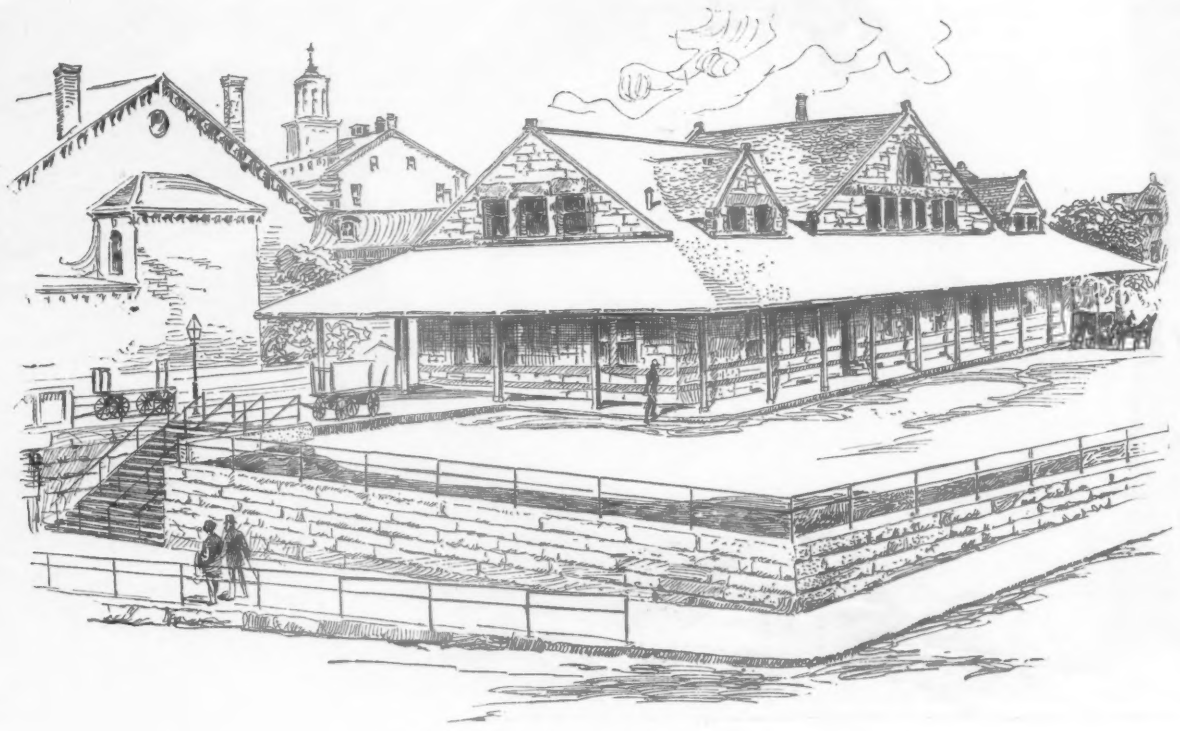
We present herewith engravings and ground plans of three railroad stations by this famous architect, whose recent death has been so universally lamented. We are indebted for them to the *Sanitary Engineer*, which has been publish



Auburndale, Mass.—Boston & Albany Railroad.



Chestnut Hill, Mass.—Boston & Albany Railroad.



Holyoke, Mass.—Connecticut River Railroad.

STATIONS ON THE BOSTON & ALBANY AND THE CONNECTICUT RIVER RAILROADS.

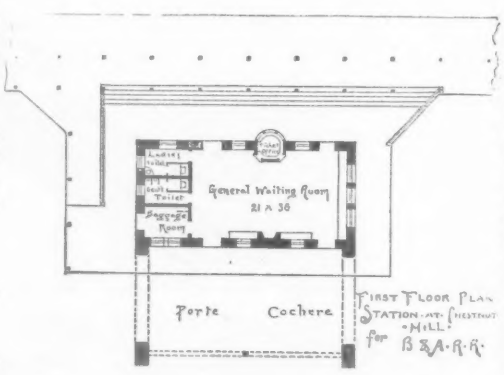
H. H. RICHARDSON, ARCHITECT.

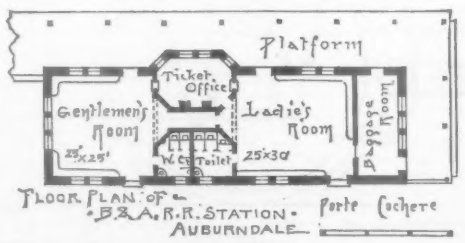
ing weekly for the past two years admirably prepared architectural drawings.

Mr. Richardson designed at various times quite a number of station buildings, several of which we have previously illustrated. Perhaps his most famous work of the kind, on account of the originality and excellence of the design rather than from its intrinsic importance, was the station in Worcester, Mass., the bold central arch of which is faintly suggested in the porte-cochere of the Chestnut Hill station. The latter might seem far too pronounced a feature for an ordinary station, but this one is at an elegant suburb near Boston, where a large proportion of those who take the train arrive in carriages, with frequent occasion for several carriages to discharge their load at once. This station is on the Brookline Branch of the Boston & Albany. The Auburndale station is on the main line, and of much the same general character, but less markedly so.

The larger cut shows the station at Holyoke, Mass., on the Connecticut River Railroad. All these stations are built of Braggville, Mass., granite, with brownstone trimmings The roofs are of red tiles, and the posts of the sheds and all of the timber-work are of Georgia pine.

FIRST FLOOR PLAN · HOLYOKE STATION · CONNECTICUT RIVER R.R.





Ground Plans of Station Buildings.

Contributions.

Diameter of Car and Locomotive Wheels.

TO THE EDITOR OF THE RAILROAD GAZETTE:

At the annual meeting of the Master Mechanics' Association held in Boston, in June last, a resolution was offered and adopted unanimously making standard finished diameters to locomotive driving-wheel centres, consisting of six sizes from 38 in. to 66 in., inclusive. Since the above resolution was adopted there has been a rapidly growing feeling in regard to adopting some proper diameter for steel-tired car wheels. There has been a custom existing among master mechanics of increasing the diameter of the forward truck wheels of locomotives somewhat above the standard sizes for chilled iron wheels; yet, in the matter of steel-tired car wheels, no action has been taken, except by the manufacturers, who have so far furnished them to correspond with a resolution adopted by the Master Car-Builders, and of the same diameter as the chilled iron wheels. In many things "custom makes laws," and it would seem that we are likely to drift into an unpleasant state of confusion on the above subject. The question now agitating some of the thoughtful minds is, "Ought we to be governed by the resolution, when the facts are that a steel-tired wheel measuring 33 in. diameter, when new, will or may become 30 in. diameter when nearly worn out, as the construction of some tires with the deep annular flange will allow the tire to be safely worn down to ¾ in. thickness?" While there are a great many passenger cars equipped with steel-tired wheels, yet they are a very small proportion as compared with the number in service. Therefore, if it should be decided to change the diameters so that the mean diameters should conform to the same nominal sizes of chilled wheels, it ought to be done as early as practicable. It would seem that too great a thickness of the tire would act injuriously in disarranging the uniform action of the brake-lever when the wheel is worn small, and by affecting the shoe by change in radius of the wheel. The general standard of a tire for passenger wheels is 2¼ in. thick. This allows 3 in. diameter of wear, changing the radius 1½ in. In adopting a mean diameter for the steel-tired wheel to correspond with the chilled iron wheel, it becomes necessary to make them 34½ in. diameter when new or about 30 in. diameter for the centre. In regard to 36 in. and 42 in. wheels, we would suggest that the present diameter of 42 in. wheels be not changed, as there is a growing opposition to so large a diameter for a standard size for passenger service. There are many good reasons for making the so-called 36 in. wheel 37½ in. in diameter when new: It will be a better compromise between the present 33 in. and 42 in. wheels, will harmonize with the wishes of many railroad officials and give a full 36 in. wheel when half worn out. We feel the importance of a careful consideration of this matter, as we have been called upon and have orders now in our works to furnish two sizes of 33 in. and 36 in. diameter, making them 34½ in. and 37½ in. diameter.

This appeal to the consideration of railroad officials is fully indorsed by all the tire makers, who are very much in sympathy with ourselves in regard to the uniformity of thickness as well as diameter. We would further add that the extra 1½ in. in their diameter will increase the mileage very materially, and in the case of 33 in. wheels the brake leverage will correspond uniformly, when they are half worn out, with the chilled iron wheels. WM. W. SNOW.

RAMAPO, N. Y., Nov. 1, 1886.

Light Bridges and Bridge Accidents.

TO THE EDITOR OF THE RAILROAD GAZETTE:

On page 96, Vol. X. (1878), of the *Railroad Gazette* there is published a table of failures of railroad bridges in this country from 1872 to 1877 inclusive, compiled by Thomas Appleton, C. E. So much of this table as relates to trus bridges is copied below.

CAUSE OR NATURE OF ACCIDENT. 1873-77—5 years.	Material or style of bridge. Howe truss.	Combination	Iron	Unknown	Totals
Fire	1	.....	.....	3	4
Hurricane	2	.....	1	.....	3
Freshet	2	1	1	12	16
Undergoing repairs	1	.....	1	5	7
Floor broken by train	10	1	.....	15	26
Bridge knocked down by train	20	2	8	10	40
Square fall	1	.....	3	.....	4
Unknown	1	1	3	21	26
Totals	38	5	17	66	126

For the years 1878 to 1885, inclusive, the following table of failures has been compiled, almost exclusively, from the monthly lists of accidents in the *Railroad Gazette*. It includes truss bridges only, and not trestles.

CAUSE OF ACCIDENT AND MATERIAL OF BRIDGE. 1878-85—8 YEARS.

YEAR.	Fire. Wood	Iron	Unknown	Freshet. Wood	Iron	Unknown	Undergoing repairs. Wood	Iron	Unknown
1878	2	.....	.....	.....	.....	5	.....	.....	1
1879	1	.....	.....	.....	.....	2	.....	.....	.....
1880	2	.....	.....	.....	.....	1	.....	.....	.....
1881	3	.....	.....	.....	.....	3	.....	.....	.....
1882	3	.....	.....	.....	.....	3	.....	.....	.....
1883	2	.....	.....	.....	1	5	.....	.....	1
1884	5	.....	.....	.....	.....	1	2	.....	.....
1885	.....	.....	.....	.....	1	5	.....	.....	.....
Totals	18	.....	.....	.....	2	25	2	.....	2

YEAR.	Knocked down. Wood	Iron	Unknown	Square fall. Wood	Iron	Unknown	Unknown. Wood	Iron	Unknown	Totals.
1878	3	.....	.....	2	.....	.....	2	.....	3	18
1879	.....	.....	3	.....	2	.....	4	1	3	16
1880	1	.....	1	.....	.....	.....	3	1	1	10
1881	3	1	5	.....	3	1	7	.....	12	38
1882	2	5	2	3	1	.....	8	.....	7	34
1883	.....	.....	5	2	.....	.....	.....	1	10	27
1884	2	.....	5	4	.....	.....	4	.....	10	33
1885	.....	.....	3	1	.....	.....	1	.....	14	25
Totals	11	6	24	12	6	1	29	3	60	201

There was also one iron bridge blown down in 1883.

Neglecting those failures due to fires, hurricanes and freshets, it appears that during the first period of five years the number of recorded failures was 103, or an average of 20.6 per year, while during the second period of eight years the number of failures was 156, or 19.5 per year. During the last five years, however, the number of failures from all causes except the three just mentioned was exactly 25 per annum.

A noticeable feature is the number of "square falls" recorded, which are but four in the former period, against 19 in the latter. This is largely due, no doubt, to the increase in the weight of trains which has been going on of late years. These figures give emphasis to the editorial remarks in your last two issues in regard to sailing too close to the wind in assuming moving loads in bridge computations. It is to be regretted that the column of "unknowns" forms so large a percentage of these tables. If all these cases could be sifted it is probable that the number of "square falls" would be found considerably larger. When a bridge fails in this manner railroad officials are not likely to advertise the circumstance if it can be avoided.

It will be noted that of the ascertainable causes "knocked down" forms the chief, 40 bridges being entered under this head during the first period, 3 of which are known to be of iron, and 41 during the second period, at least 6 being iron ones.

During the present year the writer has taken especial pains to ascertain as far as possible the particulars of all the bridge failures reported, and which are given below. The names of the designers or builders are added whenever they could be obtained, and these are sufficient evidence that those bridges at least must have been as good as could be made of the kind:

BRIDGE CATASTROPHES DURING 1886.

Jan. 4. Pennsylvania Railroad Bridge, at Duncannon, broke with a freight train.

This was an old iron Pratt truss bridge in several spans. It had been considered weak and had been supported by additional piers built up under the centre of each span, the company intending to renew the structure soon with spans of half the length of the original ones. During a freshet, one of these new piers was washed out, and a freight train soon after coming on the bridge, the span broke. This may be classed as a "square fall."

Jan. 8. Louisville & Nashville Railroad Bridge at Wilhites Ala., knocked down in consequence of collision between a freight train and the rear portion of a preceding freight, which had broken loose and stopped on the bridge. No further particulars.

Feb. 19. Wilmington, Columbia & Augusta Railroad Bridge near Hilton, N. C., struck by derailed car in freight train and knocked down. Bridge was an iron Bollman truss, 150 ft. span, built by Wendel Bollman. The derailed car struck end-post.

March 2. New York, Ontario & Western Railway Bridge at Fish's Eddy, N. Y., struck on end-post by derailed caboose of freight train and one span knocked down. Bridge was a through iron Pratt truss, in three spans of about 144 ft. each, built in 1882, by Central Bridge Works under "West Shore" specifications, and all parts of the bridge were of unusual size and strength.

March 15. St. Louis, Keokuk & Northwestern Railroad Bridge near Louisiana, Mo., broke down. Wooden bridge on fire.

March 29. Columbus & Western Railroad Bridge near Opelika, Ala., fell. Abutments weakened by freshet.

April 19. Atlantic & Pacific Railway Bridge near Aubrey, Arizona, broke. Wooden bridge on fire.

April 30. Missouri Pacific Railway Bridge near Osawatomie, Kan., reported to have fallen. No particulars.

May 24. Western North Carolina Railroad. Bridge near Round Knob, N. C., struck by derailed car of freight train and knocked down. No particulars.

May 30. Boston & Lowell Railroad. Bridge at Lebanon, N. H., went down with freight train. Bridge was a covered wooden one, built in 1865, and described as a "Childs' truss. Square fall.

June 7. Canadian Pacific Railway. Bridge over Petewawa River, near Pembroke, Ont. A steam shovel forming part of a freight train was a little too high to pass under portal bracing. Portal struck and bridge knocked down. A through iron, Whipple truss built by Clarke, Reeves & Co.

June 17. Chesapeake & Ohio Railroad. Bridge near Geigerville, Ky., struck by derailed train and knocked down. This was a through-plate girder bridge, 51 ft. long. One end knocked down off the abutment and cars fell over on it. Estimated to cost $200 to put bridge back and replace damaged parts. Built (probably) by Keystone Bridge Company.

July 6. Chicago, Milwaukee & St. Paul Railway. Bridge on Andover Branch, 25 miles north of Aberdeen, Dak., broke. No particulars. Probably a small wooden bridge.

July 27. Toledo, Peoria & Western Railroad. Bridge over Crooked Creek, near Burnside, Ill., broke. Wooden bridge, on fire.

July 31. Toledo, St. Louis & Kansas City Railroad. Bridge over Wabash River at Bluffton, Ind., broke. Wooden bridge (probably Howe truss). Square fall.

Aug. 18. Central Vermont Railroad (Narrow Gauge Division). Bridge near Brattleboro, Vt., broke down. Bridge was a thorough, combination structure, 216 ft. long, built in 1879 by C. E. Danforth & Co., of New York, after designs by A. P. Boller, C. E., the iron work being furnished by the Keystone Bridge Co. Bridge was designed for a moving load of only 1,000 lbs. per foot and had been shamefully overloaded for a long time. Square fall.

Aug. 21. Burlington, Cedar Rapids & Northern Railway Bridge at Norris, Ia., broke. Wooden bridge. On fire.

Sept. 16. Baltimore & Ohio Railroad. Bridge near Independence, O., struck and knocked down by train which had been derailed by running over a horse caught between ties on bridge. Bridge was a through iron, Pratt truss, built by the Clarke Bridge Co. of Baltimore in 1882. Span, about 90 ft.

Sept. 24. New York, Susquehanna & Western Railway. Bridge over Dundee Lake, near Paterson, N. J., went down with freight train. Bridge was a through iron one, about 132 ft. span, and had been finished only a few days. The cause of the action is somewhat of a mystery, but it is most likely that a car jumped the track on bridge and struck truss. Designed and built at the Passsaic Rolling Mill, but erected by the railroad company.

Now among all the iron railroad bridges which have fallen in this country from 1872 to date from causes other than freshets and hurricanes (being 36 known cases in all, with probably a good many more classed among the "unknowns"), there is not, so far as the writer has been able to ascertain, a single instance of the failure of a riveted truss. Every one of the iron bridges recorded, it is believed, were of the pin-connected type. In very few cases could failure be attributed to any lack of skill in design, to inferiority of material or to bad workmanship. The reputation of the distinguished engineers and manufacturers whose names are associated with the fallen structures forbids any such supposition. Some of these names are given in connection with the failures of the current year, and others no less celebrated might be cited in previous years. And since it is undeniable that the best obtainable engineering skill, material and workmanship have been put into so many pin-connected bridges which have failed, it necessarily follows that the immunity of riveted structures from these accidents can only be due either to sheer good luck or else to the peculiar features of the bridges themselves. If loaded beyond its carrying capacity, a riveted bridge must, of course, break down the same as any other. That no riveted bridges have thus failed proves that none have been so overloaded. And to this extent, perhaps, they have been favored by fortune—it may have been the good luck of their builders to get them strong enough in the first place to stand the future increase in loads which proved too much for other bridges, or it may have been the good luck of the bridges themselves to escape the heavy loads which broke down their neighbors. All we know is that there are no riveted bridges classed among the "square falls."

But when we come to the "knock down" argument which has proved so terribly fatal to both wooden and iron bridges, good luck can no longer be said to account for lack of failures among riveted bridges. Cars get off the track on these bridges just as easily as on others, and the trusses are struck just as hard and as often. Cases might be cited of accidents causing injury to almost any member one could suggest. Upper chords have been struck by cars falling from above. Lower chords have been struck by cars off the track on the bridge, and by cars and boats passing below. Floor beams, stringers and web members (sometimes half a dozen in one truss) have been bent, twisted and torn in the most fantastic shapes. End-posts have been ripped and bent, and even torn entirely clear of their connection with the lower chords. But no bridges have fallen.

Now it is not maintained that every time a pin-connected bridge is struck it will go down; on the contrary, they have been known sometimes to stand up under the most severe shocks. But it is held that a goodly number have been wrecked notwithstanding all that science could suggest or skill produce in the manufacture. It is not asserted that a bridge never will fall if its parts be simply held together by rivets; on the contrary, even if in itself amply strong for any contingency, it might be knocked off the abutments. But it is submitted that although a great many of these bridges have been subjected to very severe tests, some of which would certainly have proved fatal to a pin-constructed bridge, no American riveted railroad bridge has yet failed.

Mr. Editor, the writer cordially indorses your views as to the wisdom of assuming heavier moving loads than are usually adopted in the computation of bridge stresses. If this were done generally the number of "square falls" in future tables of bridge mortality would dwindle. But while we are about it, would it not be a wise move to reduce also, if possible, the number of "knock downs," inasmuch as these accidents have always far outnumbered any other kind which happens to bridges? And if it be true that all of the iron bridges which have been knocked down were of one kind, and if there be another kind many individuals of which have been knocked *at*, but not knocked *down*, does not this indicate the course to be followed in order to attain the desired result?

In 1874 and thereabouts a controversy of considerable length and some ascerbity appeared in your columns relative to the respective merits of riveted and pin-connected bridges for railroads. In commenting on the subject the *Railroad Gazette* rather sought to excuse some failures which had been cited, on the ground that the bridges referred to did not "fall," but were "knocked down." But, as a writer at the time most truthfully said, it is small consolation either to the maimed survivors, the bereaved relatives or the company which pays for the damage, to know whether a bridge *falls* down or is *knocked* down, so long as it *goes* down.

CHAS. F. STOWELL.

[Two circumstances need to be remembered in considering the above which the writer does not mention: first, the very small percentage of riveted steel bridges of any considerable span in the country, and secondly, that in the great majority of cases of knocked-down bridges a re-railing safety frog in connection with a heavy guard-post to protect the truss would have saved the bridge.—EDITOR RAILROAD GAZETTE.]

Tie Preserving Works at Laramie.

The following additional details in reference to these works should have been given in connection with our illustrated description of last week, but were by accident omitted. They contain the more important practical conclusions, and it is to be hoped that their separate publication may lead to their attracting more rather than less attention, since there are few roads that have not a direct interest in their subject matter.

The table given last week of actual work for a month shows that 31,006 ties were treated, aggregating 127,792 cubic ft., which weighed, at 29.51 lbs. per cubic foot, some 3,771,142 lbs., and which absorbed 44.53 per cent. of zinc solution, or 1,679,289 lbs. of an average density of 1.46 per cent., so that the total quantity of 24,429 lbs. of pure zinc chloride, or over 12 tons, was absorbed.

The average absorption of solution was 18,057 lbs., or 9 tons, per load, so that each tie absorbed on an average from 6 to 7 gallons, or 20.79 per cent. of its bulk, and 44.53 per cent. of its weight, which are considered quite satisfactory results.

The German experiments have determined that in order to be effective the absorption of pure chloride should not be less than 0.20 to 0.25 of one per cent. of the weight of the wood. They are here shown to be 0.65 of one per cent., or nearly three times the quantity thought necessary abroad.

These results may not be attainable with all woods, nor at different seasons of the year with the same wood, as much of the absorption depends upon the state of seasoning or dryness of the ties; but the dry mountain air of Laramie specially favors an early desiccation of cut timber.

The total cost of treatment, including repairs, wear and tear, and interest on the plant, is estimated to be 18 or 19 cts. per tie, and it is expected to lengthen their life, which is now some four or five years, to 12 or 15 years.

The economical results may, therefore, be estimated as follows:

Unprepared pine ties now cost in the track some 55 cts. each. They last, say, four years, and the cost thus averages 13¾ cts. a year each. After treatment they will cost, say, 75 cts. each laid in the track, and if they last 12 years the

average cost will be 6¼ cts. a year each. If they last 10 years (and Burnettized ties are found to endure from 12 to 18 years in Germany) the average cost will be 7½ cts. a year.

Thus it will be seen that upon a railroad like the Union Pacific, with some 5,000 miles of track laid with about 13,000,000 of ties, the process, if well carried out and looked after, promises to effect large economies.

Recent Progress in Germany in Securing Safety in Railroad Operation.

An article in the *Archiv für Eisenbahnwesen* some months ago gives some information on this subject which is of general interest.

The first legislation in Prussia designed to promote safety in railroads was in 1828, when laws were passed establishing negotiations for the maintenance of the railroads, their operation, the conduct of passengers, and the duties of railroad officials and employés, mainly designed to promote safety. In 1843 the *German Railroad Journal* was established, for the same purpose, and shortly after the German Railroad Union, the great co-operative association of railroad managements, which now includes the railroads of Holland and some of those of Belgium as well as those of Germany, Austria and Hungary. This association receives questions from all its members in regard to points of management, and collects and collates information from the different members as to their experience on such points.

The close of the French war left the German railroads in very disturbed condition, which prompted renewed interest in the means for securing safety in the traffic, and in 1873 the Prussian Ministry of Public Works called together a conference of the railroad officials in the kingdom in regard to the matter. Certain conclusions were reached at this conference as to the direction which improvements in the management of the railroads should take, but for a variety of reasons not much was accomplished for several years. In the last half of the decade, however, railroad traffic became very active through the growth of business under consolidated North Germany, the activity produced in invention by an improved patent law, and the gradual consolidation of the small and powerless roads into the powerful organizations controlled by the state. In 1880 another conference was called, and from that time annual meetings have been had; and the development of appliances for safety and economy of working has been carried on in a systematic manner. The result of these has been the revision of the service regulations to get rid of ambiguities and obscurities; sharper definition of the duties and responsibilities of employés; reduction of the hours of labor where they appeared excessive; uniformity of signals; extension of access to danger signals to passengers; increased diligence in the inspection of the road-bed and structures; choice of better car couplers; improved brakes; precautions against breakage of axles and wheels; recording the speed of trains; improvements in switch and signal service; arrangements for prompt assistance in case of accidents; premiums for discovery of defects in rolling stock or road.

The uniformity of traffic regulations is well compared to the oil in a machine which modifies the friction at points of contact of different systems.

Most of the improvements as indicated above have been more in the interest of economy than of safety.

The collection of statistics, by which alone the chief causes of danger can be ascertained, has had special attention. The following tables throw an interesting light on these causes. They are of almost as much value to us as to the German systems, embracing as they do the whole of the German Empire, where the roads, although on an average more solidly built, have very much the same average character as our own as to grade crossings, care of switches, and mode of operating.

TABLE I. DERAILMENTS.

Traffic year.	Between stations.	At stations.	Total.
1880-81	158	325	483
1881-82	93	295	388
1882-83	104	341	445

of which there are due to

	Obstructions on track	Wrong position of switches	Wrong position of other movable apparatus	Wrong handling of train service	Defective superstructure	Defective rolling stock: Broken axles	Defective rolling stock: Broken tires	Defective rolling stock: Other defects	Other causes
1880-81	36	133	18	26	23	34	55	39	119
1881-82	12	145	10	17	25	16	30	22	81
1882-83	22	143	20	20	24	15	33	62	100

TABLE II. COLLISIONS.

Traffic year.	Between stations.	At stations.	Total.
1880-81	79	403	482
1881-82	44	366	410
1882-83	34	312	346

of which there are due to

	Wrong disposition of force	Misplaced switches	Non-observance of signals	Too rapid approach	Careless switching	Unlawful meeting of rolling stock	Train parted	Other causes
1880-81	36	107	48	13	93	53	47	95
1881-82	36	81	49	11	113	66	13	31
1882-83	3	82	56	13	111	34	10	29

TABLE III.—OTHER ACCIDENTS.

Traffic year.	Between stations.	At stations.	Total
1880-81	718	1 821	2 539
881-82	706	1,842	2,548
1882-83	684	1,840	2,524

of which there are due to

	Running over vehicles.	Fire in trains.	Boiler Explosions.	Other accidents involving injury or death to persons
1880-81	59	10	....	2,470
881-82	60	9	....	2,471
1882-83	62	9	....	2,453

The last column in each of the three tables represents accidents due to causes which could not be foreseen or provided for, or to the fault of outsiders and not in any way due to management of the railroads.

The author divides the subject of improvement into three heads: "road-bed and structures;" "rolling stock;" "operation."

In regard to the first, he finds nothing to recommend except more perfect drainage to avoid slips and slides, and better watching of track to detect them in advance of the passage of trains. He refers to the progress in iron bridging, which has become a necessity for the carrying out of modern railroad enterprises, but advocates stone bridges for safety. He refers to the improvement in track resulting from abandonment of the mistaken idea that the function of ballast was elasticity and not simply drainage.

This false conception led to shutting up the ballast by dirt at the ends of the ties, leading to the retention of water; also to the use of soft materials which disintegrated and gave rise similarly to imperfect drainage. He believes that the limit of profitable use of wooden ties has been reached, more on account of safety than economy. Many accidents have been caused by the spreading of track caused by inability of wooden ties to hold spikes properly.

Rails and their joints the author considers in an advanced condition as to safety, as compared with other appliances. Rail breaks seldom occur and are almost always discovered before an accident is caused.

Grade crossings are a serious source of accidents. City crossings are being carried over or under in almost all cases to-day—the old grade crossings being altered as far and fast as the situations and resources of the companies permit. All grade crossings are provided with bars and attendants, and where a good view cannot be had of the track, with electric bells also, to give warning of the approach of trains.

The German authorities are also wrestling with the subject of car couplers, but their problem is the avoidance of train parting more than injury to brakemen; though from an American's point of view their whole system, with its cumbrous screwing up of the cars together, seems badly in need of reform.

A great deal of improvement has taken place in axles of late years, through better proportions and more careful manufacture and inspection in operation. The breaks decreased from 1 in 776 vehicles in 1870 to 1 in 2,857 in 1880. The author suggests the possible desirability, in view of the fatigue of the material to which axles are exposed from the millionfold changes of strain, of setting a limit to the time that any axle shall remain in use. He suggests, as a desirable novelty, without mentioning that it has ever been applied in other countries, an arrangement for holding up the ends of a broken axle, with a view to avoiding derailment.

In regard to tire breakages, it would seem, from the author's remarks, that there is a tendency to reaction to wheels with solid centres, on account of the difficulties arising from the tension put upon the tires in shrinking them on. This is in accordance with the statistics given in our "Foreign Notes," Aug. 14, 1885, where solid wheel centres have the remarkably low percentage of 0.06 per cent., while the lowest spoke wheel with separate tire percentage is 0.26 per cent. These returns, by the way, do not show nearly so great an advantage for steel tires over chilled wheels as comparison in the English climate does.

The German average percentage for spoke wheels with separate tires is 0.26, while the Pennsylvania average for all chilled wheels is 0.74, and the Erie average for best makers 0.32.

It is rather amusing to hear that chilled wheels can't bear brakes, because of the unequal tension on the wheels caused by the heat of braking.

The author suggests the possibility of avoiding shrinkage tension of tires by clamping them to the felloe with clamp entering a groove in the side of the tire and held together by bolts through flanges inside the felloe—a rather awkward device, it would seem.

The Prussian authorities, prompted by the still prevailing frequency of tire breakages, raised, in 1883, the minimum thickness allowed for steel tires, as follows:

Thickness to which tire may be reduced by last turning in shop, 30 *mm.* = $1\frac{7}{32}$ in. for locomotives, tenders and passenger train wheels, and for other wheels 25 *mm.* = 1 inch scant; while the minimum thickness to which tires may be worn is 24 *mm.* = $\frac{31}{32}$ in., and 20 *mm.* = $\frac{25}{32}$ in. for the two classes respectively.

In brakes the German roads have been more behindhand than in any other department of railroad apparatus; only the prominent express trains on most roads having up to this day continuous brakes of any sort. The author devotes considerable space to proving the desirability of these brakes, which found their earliest introduction to German roads in the form of air brakes in 1877, when the following brakes were tried:

Heberlein, automatic friction.
Westinghouse, Carpenter, Steele. } automatic pressure.
Smith-Hardy, non-automatic vacuum.
Sanders, automatic vacuum.

These brakes were tried for six months, and after due consideration and report by experts, the matter got on so far by 1884 that the budgets for 1884–85 and 1885–86 each contained an appropriation of $150,000 for applying continuous brakes. The brakes selected were for main routes, the Carpenter; and for small lines where most trains are "mixed," the Heberlein.

The Carpenter is a modification of the Westinghouse automatic, in which the auxiliary air reservoir under each car is discarded and the pressure stored in the brake cylinder itself. Its action is not so rapid as that of the Westinghouse. The Heberlein is operated by friction rollers working against a drum on the car axle. The friction rollers are set in a swinging frame and held up when in use by vertical rods, which are hung to a horizontal rope tightly drawn under the train, fastened to the last car and drawn up by a reel in the engine cab. The release of the reel lets all the rollers fall into contact with the axle drums and puts on the brakes. The breaking of the train has, of course, the same effect, and by making the vertical bars in two pieces connected by a hook, the means is furnished of letting any particular brake operate without the others. The disconnection of this hook is placed within the power of the passengers and brakemen by suitable appliances. It has the advantage of allowing the ready introduction into a train of cars not provided with the apparatus, and there is no danger in long grades of the brake power giving out. On the other hand, damp weather, frost and snow impair its efficiency by reducing the roller friction; and the regulation of it depends upon the length of the operating rope, which is liable to variations, generally taking effect more at the front end of the train, causing the back cars to crowd up. Putting a car into the train is troublesome, because all the brake rollers have to be hooked up when train is broken in order to allow switching.

For the regulation and checking of train speeds, the Prussian authorities, after trying a number of speed recorders without full satisfaction, have concluded to introduce an "electric contact" apparatus, which has now been in use for nearly ten years, and on the Elberfeld system of Prussian roads is used on 144 miles of track.

It consists of electric keys with strong springs placed outside the rails at regular intervals, the most approved distance being one kilometer. The keys are depressed by each wheel, and the current thus sent through a wire to the next telegraph office causes a strip of paper moved by clock-work to be dotted for each depression. The paper moves at the rate of four centimeters a minute, and the distance apart at which the first dots of each two successive series appear shows the rate of speed at which the train is moving. When the operator at a station gets word from the next one of a train's departure, he sets the paper in motion and lets it run until the train reaches his station. The strip of paper which has run off in the mean time is marked by cross strokes at its end; and the date, the number of the train and engine, and the name of the engine runner are written upon it. The operator soon becomes accustomed to recognizing the speed from the appearance of the spaces, and he is charged with the duty of noting any obvious excess of the speed allowed.

At the end of the day the strip is removed and sent to headquarters as a part of the office report, the work of inspection being made easy by the notes on the strip. The runner is placed in position to check up his own speed, as the contact-keys are visible by day and recognizable by their flick at night.

This method is reported as highly satisfactory in checking the tendency of runners to save coal by "loafing" up hill and running down at full speed. The apparatus being arranged to show the speed for any desirable distance or at any point shows whether express trains slow properly in passing stations, and it also indicates very closely the occurrence of a break-down and its position. Although not suggested, the contact-key, by a prearranged system, could be operated by levers carried on all trains, and made the means of calling for assistance and stating the nature of the difficulty, such as "stalled on grade," "stuck in snow," etc.

The author reviews the history of interlocking switches and signals, and credits the first operation of switches and signals at a distance to an English engineer, Mr. Stevens, in 1847; and to Saxby in 1857, the first application of interlocking.

Saxby & Farmer put up the first interlocking apparatus in Germany at the Stations Börssum and Jerxheim, of the Brunswick Railroad, in 1870. From this beginning there has been an increasing extension of such apparatus every year, and a manufactory for the construction of the appliances has been put in operation by Jüdel & Co., at Brunswick. On the Elberfeld system alone $206,878 were spent on interlocking apparatus between 1875 and 1880, and on the collective Prussian state roads 842 signal cabins at 389 stations have been fitted up. In the last six years $1,500,000 has been spent on the Prussian state roads for this purpose, and for each of the years 1884–5 and 1885–6, $200,000 additional has been appropriated.

The author closes with the statement that no unprejudiced traveler will deny that the German railroads are not equaled and certainly not excelled by any foreign roads as respects the comfort of the vehicles, the convenience of the station arrangements, the attentiveness of the officials, and the care of the management for the information of the public; and says that similar claims can now be made for the safety of the traffic. So far as the convenience of station arrangements and the attentiveness of officials and the information to the public, there is not a great deal to wish for; and as to baggage arrangements, the Germans are certainly ahead of the English. They are a long way ahead of us in the politeness of official

and attention paid to the traveler, but perhaps a little behind the English in this respect.

Their railroad guides are the best in the world, and might be well copied by our guide-makers in more than one respect, particularly in the indexing arrangements. The German railroad guide has a skeleton map with the lines on which through trains are run in heavy lines, and numbers are attached to all the lines on this skeleton map referring to the pages in the guide where the route in question is to be found. The Germans, however, have only to give information for some 40 000 miles of road, and on a comparatively small territory, and can do what is impossible in a single volume for our 135,000 miles and half a continent.

As to safety appliances and the generality of their application, the English roads are still somewhat ahead of the world, and we are behind the Germans somewhat, though far ahead in the matter of brakes.

When it comes to comfort and convenience of rolling stock, however, we can put in a little plea to the unprejudiced traveler, to whom our author appeals so confidently, to say whether a journey could be made from New York to San Francisco with German appliances with the comfort that is to be found in the same grade of vehicle here—backing their first-class with sleeping cars (a very expensive luxury there) against Pullman's stock; second against our first; third against our second, and fourth against our emigrant. The second-class German car compares favorably with our first as a place to sleep in, but it not as well ventilated or lighted, and in summer would be unbearable here on account of the heat in the small, heavily upholstered compartments, while the necessity when the compartment is well filled of sitting face to face with a more or less uncongenial fellow traveler is not pleasant. Mr. Paine has mentioned the advantage in European cars of ventilation at the top instead of the bottom of the window when individual ventilation is desired.

German third-class accommodation is often much better than our second—not on account of the construction or fitting up of the car, but by reason of the provision of non-smoking and ladies' compartments in this class; but on a long journey the want of any water-closets in this class, and indeed in the higher classes in many cases, is very annoying.

THE SCRAP HEAP.

Railroad Young Men's Christian Association.

On Friday, Oct. 29, the Association at Minneapolis gave a "Book Reception," for which an attractive programme was arranged, consisting of music and an address by President Cyrus Northrop, of the University of Minnesota.

The following extract, from the circular sent out by the committee, will explain their object:

"It is our aim, through this reception, to lay the foundation for a good circulating library for the use of railroad men and their families.

"You are asked to further this object by donating one or more books at this time, or, if preferable, the money to purchase the same. Books can be sent to these rooms at any time before the evening of the reception, or brought at that time (admission being by a good book or at least $1 in money), or, if this prove inconvenient, we will be glad to call for such books as you may be pleased to contribute?

"Works of history, travel, science; standard works of reference; treatises on mechanics; in short, any good book that has proved of value to you will be valuable to us. You doubtless have books which, having served their term of usefulness or pleasure to you, would prove of like usefulness and pleasure to our railroad men when placed here.

"We believe that a good library will carry educating and uplifting influences to many of the railroad men who are seldom able to visit our reading rooms."

The Rio Accident.

The most shocking accident which has occurred in Wisconsin for many years took place very early on the morning of Oct. 28, near Rio, a small station on the Chicago, Milwaukee & St. Paul Railroad, about 12 miles from Portage. The fast limited express, which leaves Chicago at 7:30 p. m. for St. Paul, ran into an open switch, and the engine, baggage car, passenger coach and three sleepers were wrecked. The baggage car, coach and two sleepers were burned.

Only three of the passengers in the coach escaped—a man and two children. The man's leg was broken, but he succeeded in forcing his way through the ventilator on top of the car, with most of his clothing burned off and with his flesh bleeding from cuts inflicted by broken glass. The children were a baby, 4 or 5 months old, and a little girl aged 5. Their mother was wedged in at the waist, unable to move. The overturned stoves immediately set fire to the car, which was soon enveloped in flames. An attempt was made to uncouple the sleepers and pull them away from the fire, but the coupling had been blocked. The passengers in the sleepers were hurried out, and the cars were soon all a sea of flames.

The shrieks of the passengers in the first coach were appalling, and the air was filled with pitiful cries for help, which could not be given. In less than 10 minutes their cries had been stifled and all the occupants of the car, with the three exceptions named, had been burned beyond recognition. The conductor says there were at least 17 passengers in the car. The fire was so fierce that nothing was left of the cars except the iron trucks.

The conductor and brakeman of the freight train saw the crash, and escaped to the woods. They have since returned, and each blames the other for leaving the switch open.

The engineer of the limited states that he only saw that the switch was open when within three car-lengths of it. He reversed and applied the air brakes. The engine plowed into the sand on the right of the track on its side, a distance of about 30 yards, and was disabled. The conductor and brakeman of the limited were jammed in by the fallen baggage and the baggageman had one leg broken, but all three managed to escape from the car. The five mail clerks and most of the mail were saved, but some 60 sacks were burnt. Bishop Whipple, of Minnesota, was in one of the sleepers but escaped, and helped to rescue the two children from the coach.

The accident was undoubtedly caused by the open switch. The switch light was only visible a short distance off, as the spot is approached on a curve situated in a cutting. A freight train had taken the siding at Rio, according to orders, but the switch had not been closed, and the responsibility rests on some of the trainmen.

Fast Time.

A special train on the Louisville, New Orleans & Texas road left New Orleans on Tuesday morning, Oct. 26, at 5:30 o'clock, and reached Memphis at 6 o'clock the same evening, having made the trip in 12 hours 30 minutes. The number of stops is not given, but it is stated that the total time actually taken in running the distance of 455 miles was 10 hours 10 minutes, giving an average speed of 44.75 miles an hour.

Very Thoughtful.

A brakeman in the employ of the Delaware & Hudson Canal Co. is a very obliging person, and thoughtful withal. An excursion party, which included many young men and women, recently made the trip from Albany to Lake George, and as the train would near a tunnel—of which there are a good many on the line—he would call out, in stentorian tones: "Gents, choose your partners for the tunnel."—*Matthews-Northrup Guide.*

Pathfinders.

"Isn't it dreadful," asked Miss Lilybud, "to run over a man?" "Yes indeed, mum," replied the stoker on old 93, "musses the engine up wuss nor a cow."

The train broke in two, the engineer backed up, and the next minute the cheery brakeman called "All right here!" and the train rattled swiftly on its way. "What was the matter?" asked the conductor. "Coupling pin broken," said the brakeman. "Where did you get another?" "Didn't. Couldn't find one. So I just drove in a radish I got at the lunch counter and it holds like a first mortgage."

After his uncle William got to be one of the directors of the Whoa, Haw & Gee Short Line, Charley Taperfinger was taken from the ribbon counter of Blanc & Black's, and made a passenger conductor. He got along pretty well on his first trip, gathering up the tickets, and politely asking each passenger "if there was nothing else?" until a man tendered a bill for his fare. Then the new conductor took the bill, folded it around his punch, looked anxiously up and down the car, and rapping on the back of the seat with his pencil called out "Ca-ish! cash! that boy is never around when you want him."

All the waiters in the dining station at Basswood siding struck, and old Mr. Thistlepod, who had leased the restaurant, undertook to run it himself. When a ravenous guest dived himself into the room at the head of the procession, for a twenty-minute gorge, the old man met him at the door, shook hands with him, took his hat and said, "Well, how be you? Goin' west? Dusty travelin'. Reckon ye'll stop for dinner? Well, set down, set down. Git yerself cooled off a bit, an' I'll see if the folks can git you up somethin' to eat in a minute or two. Here's yisterday's paper to look at while you're waitin'." And as the old man poked off toward the kitchen, the conductor called "all aboard," and the old gentleman swears that the railroad company is in league with the strikers to break down his business.—*Burdette, in Pathfinder Guide, for November.*

An Immoral Locomotive.

Traveling man—"There is no hope for the East; morals all gone, nothing but defalcations and embezzlements every hour of the day."

Omaha man—"Oh, I guess it's not quite so bad as that."

"As bad as that? It's worse. Why, in Massachusetts even inanimate objects are becoming untrustworthy."

"Oh! Come now."

"True as preaching. Why in Boston the other day a locomotive, during the temporary absence of the crew, broke loose and ran away with the pay car."

Doubtful.

On a small office building in Jackson, Miss., is the following sign:

Y. & M. V. Ry.

A man, whose ideas were considerably tangled by mixed drinks, stood gazing at this, to him, cabalistic sign for a long time, occasionally rubbing his eyes to see more clearly. At last he approached a bystander with the salutation and query:

"Cap'n, what's that build'n'?"

"That is the Yazoo & Mississippi Valley Railroad office," was the reply:

"Oh!" responded the inebriate, brightening up: "I wash 'fraid Young Men's Chris'n 'Sociation 'dcome here."

It Made a Difference.

"Gentleman just called to see you, but was in a hurry and had to go," said the Private Secretary as the railroad President returned from lunch.

"What did he want?"

"A pass to Chicago."

"If he returns, refuse it."

"He has just been elected to the Legislature."

"Oh—ah—why didn't you say so? Run out and see if you can't find him, and tell him I'll willingly pass his whole family to San Francisco."—*Wall Street News.*

TECHNICAL.

Locomotive Building.

The New York, New Haven & Hartford Co. has a Philadelphia & Reading locomotive, with Wootten fire-box, now in passenger service on its road. The engine is being subjected to a thorough test, with a view to the adoption of the Wootten boiler on the road.

The Car Shops.

The Pullman Car Shops in Pullman, Ill., have received contracts for building 500 gondola cars for the Union Pacific road.

The Harrisburg Car Manufacturing Co. has taken a contract to build 250 box cars for the Pittsburgh & Western road.

The Missouri Car & Foundry Co in St. Louis has recently taken several heavy contracts for cars, and has work enough to keep its shops busy for several months.

The Laclede Car Co., in St. Louis, is building a number of passenger cars for the new cable railroad in Kansas City.

The Philadelphia, Wilmington & Baltimore shops in Wilmington, Del., have begun work on 17 new passenger cars for the road.

The United States Rolling Stock Co. has its shops at Hegewisch, near Chicago, full of work, both in building new cars and in repairs.

The Lehigh Valley Railroad shops at Packerton, Pa., have commenced to build a number of Tiffiny refrigerator cars.

The Jackson & Sharp Co. in Wilmington, Del., is building several passenger and baggage cars for the new Georgia Midland & Gulf road.

Bridge Notes.

The King Iron Bridge Co. in Cleveland, O., has just completed a highway bridge over the Westfield River at Huntington, Mass. It is 140 ft. span.

The Phœnix Bridge Co. in Phœnixville, Pa., has just completed an iron bridge over Bull Creek near Columbus, Ga., on the Georgia Midland & Gulf road.

Manufacturing and Business.

Westinghouse, Church, Kerr & Co., of New York, have furnished a new 50 h. p. Westinghouse engine for a steam launch now under construction for the United States government, by E. J. Codd & Co., in Baltimore.

A large Westinghouse engine has just been placed in the mill of the Arthur Coal & Lumber Co., at Swissvale, Pa. A second engine of these same pattern has recently been shipped for a large saw mill at Los Angeles, Cal., where the first engine has been in use for some time.

The I. P. Morris Co., in Philadelphia, is building 2 large blowing engines for the Pioneer Iron Co., at Birmingham, Ala., and some heavy machinery for Calumet & Hecla Co.'s copper mines in the Lake Superior region.

Iron and Steel.

The Roane Iron Co., in Chattanooga, Tenn., expects to have its steel works in operation early in December.

The Abbott Iron Co., in Baltimore, has decided to go out of business and wind up its affairs. The works, which were first started nearly sixty years ago, have not been in operation for some time.

The Ajax Forge Co., in Chicago, has the contract for all the iron work for the extensive new ore docks which are to be built at Ashland, Wis., for the Milwaukee, Lake Shore & Western road.

Carnegie Brothers & Co. put an additional furnace in blast at Braddock, Pa., last week, making six furnaces now in operation there.

The Old Colony Iron Works at Taunton, Mass., were almost entirely destroyed by fire, Oct. 27. The buildings were entirely destroyed and the machinery very badly damaged.

It is announced that the property of the St. Louis Ore & Steel Co. is to be taken out of the hands of the Receiver and returned to the stockholders early in January. The debts of the company will be funded in an issue of $2,600,000 bonds, secured by mortgages on the property.

The Rail Market.

Steel Rails.—The market is active, with a good deal of new business reported, but quotations are steady at $34@$34.50 per ton at Eastern mills, with $35 named for early deliveries.

Rail Fastenings.—An active demand is reported and there is some talk of an advance in prices, but quotations still remain unchanged at 2.40 cents per lb for spikes in Pittsburgh; 2.75@3 cents for trackbolts and 1.70@1.80 for splice bars.

Old Rails.—The market for old iron rails continues active and quotations are $21.50@$22.50 per ton at tidewater, although buyers are unwilling to go above $22. Old steel rails are in demand, with a very short supply, and quotations are from $24@$25.50 per ton in Pittsburgh.

Car Couplers.

Mark's automatic coupler has recently been making considerable progress, orders having been filled for couplers for about 4,000 cars. Among these are 450 for the Delaware & Hudson Canal Co. and 600 for the Cleveland, Columbus, Cincinnati & Indianapolis. These couplers are to be put on new cars now building for that road at the Litchfield Car Works, and it is understood that the entire freight equipment of that company is to be provided with the coupler. The Toledo & Ohio Central and the Flint & Pere Marquette roads have also adopted this coupler for their freight equipment. The Mark's Automatic Car Coupler Co. has recently purchased the old Pullman shops at Kensington, near Chicago. These, with the shops already in use at Cleveland and Pittsburgh, will give the company ample facilities for turning out work and filling orders.

Phelps Induction Telegraph.

Mr. Lucius J. Phelps, of the Phelps Induction Telegraph Co., has patented a device whereby the same wire used for telegraphing to or from the trains is worked "duplex," thus enabling it to be used as an ordinary Morse wire for intercommunication between stations, for local telegraphic business, and simultaneously for telegraphing to and from moving trains.

The improvement is designed to save the expense of two different wires, and will be applied by the Phelps Telegraph Co. at once upon the Lehigh Valley Railroad, upon which it is now placing the system.

The New Car-Wheel Foundry.

The *Railroad Gazette* of Oct. 22 contained a description of the new Rood & Brown Car-Wheel Works, at Buffalo, which was correct except as to time. The works have now been in operation several weeks, and have been designed for manufacturing only the highest grade of cast-iron wheels. A remarkable test in demonstration of their success in this was made a few days since in the presence of a chance visitor. A 33-in., 572-lb., wheel was taken at random from stock just completed and laid flat on an iron disc which rigidly supported the rim, but not the hub, of the wheel. A 1,235-lb. cast-iron ball was then dropped 25 ft., striking fairly on the hub without producing a fracture or crack of any kind. The wheel used in this test was of the Washburn double-plate pattern. A sample wheel which was broken up for the inspection of the visitor showed that a high quality of car-wheel iron was used and remarkable success obtained in securing a perfect chill.

Demand for Car-Building Material.

It is worthy of note that so many of our correspondents mention the demand for car-building material. Such reports come from Michigan, Wisconsin and the South, showing that there is a revival in providing new equipment for the railroads that is co-extensive with the country. There are evidences that this particular demand has but recently acquired headway, and is now scarcely at its full tide.—*Northwestern Lumberman.*

Woven Wire Fencing.

A somewhat novel form of wire fencing has been introduced by the McMullen Woven Wire Fence Co. of Chicago. It is a woven wire netting without barbs. The top and bottom are made of three compactly twisted steel wires, which gives strength and stability to the fence. Each joint is made by a double twist of the wires.

Two sizes of mesh are made, 5½ in. by 10½ in. and 4 in. by 8 in. Among the advantages claimed are the following:

Having strength without much surface, it is not affected by severe wind or snow storms, and it will stand erect where a board, rail or slat and wire fence would be leveled to the ground. It is strong, easily handled, durable and ornamental, and can be taken down, rolled up and carried to other points without injury. It is peculiarly adapted to sections where timber is scarce, as it can be put on either wooden or iron posts.

It is also claimed that, while it is durable and effective against both large and small animals and poultry, it will not collect snowdrifts, obstruct the view or injure the fleece or hide of sheep and cattle.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE RIO DISASTER.

The most serious railroad disaster of the year (let us hope), and certainly by far the most distressing one, has come almost at the last of it. "Accident" it cannot be called in any proper sense, since its origin can be directly traced to the use of inferior appliances when better exist at a reasonable cost; viz., three-throw stub switches, instead of split spring switches, which are safe against trailing derailments at least, while its horrors were intensified, and it may even be, possibly, wholly caused by the use of inferior heating appliances; for no one appears to have lost his life in the "accident" except the 17, more or less, who were burned to death in one car. With its usual clearness of vision the daily press harps only on the heater question and passes over the stub-switch question entirely, but the latter is perhaps the most important to railroad men, in a practical sense, since prevention is better than cure.

In saying this we by no means wish to deny or obscure the fact that had the best practice been followed in any one of several details the "accident" would either have been avoided altogether or reduced in severity. It does not necessarily follow that the management is so greatly blameworthy for not having followed the best practice in any detail, nor even for using the stub switches, which were the immediate cause of the disaster. Had the disaster occurred on an Eastern trunk line, the management would have been placed under just condemnation. Should a similar one occur five or ten years hence on the Milwaukee & St. Paul main line, or on other similar lines, its management would likewise be wholly in fault. Perhaps in the eyes of infinite wisdom they are now, but we do not care to assume such wisdom. At present it can only be said with positiveness that while it cannot be expected nor demanded that stub switches should be immediately pulled out, or even wholly abandoned for new work, because something better or safer was known to exist, yet that their use has been continued longer than was right or expedient, especially in the West, where they are far more common than in the East on lines of equal traffic, and that we see in this accident the consequences.

In fact the consequences can be seen in almost every monthly accident report, although this particular form of accident (from misplaced trailing switches) is less common than others, and our weak human nature generally neglects the moral of all but the more serious disasters. The Milwaukee & St. Paul (like a number of other Western roads) has great numbers of stations, of which Rio is one, provided with three-throw stub switches and double side-tracks. At midnight on Oct. 27–8 both of these side tracks were occupied by separate halves of a freight train which had just pulled in from the west to let the new west-bound limited pass. Whether from forgetfulness or lack of time (the accounts differ), the switch had not been thrown back behind the train for main track when the limited came along down grade "at 45 miles per hour," the accounts say, and ran off the trailing stub ends. The engine appears to have run about 250 ft., and half of it on its side, so as to derail only a baggage, mail and passenger car, and the front truck of three sleepers, leaving the rest on the track. This seems marvelously quick stopping for such a speed, but it is well to remember that Mr. Westinghouse once stopped an experimental brake van going at 45 miles an hour in 288 ft., so that it was not beyond physical possibility to have stopped the train by brakes alone, so that no great harm could have resulted, even within the brief notice of three car lengths. As it was, the air brakes, applied by engineer Little with a courageous coolness in the face of death (which should not be forgotten, and which it is to be regretted that there is no formal way to recognize), unquestionably saved more than half of the disaster.

Then, "in less than a minute after the crash," the conductor testifies, the awful work of the flames began, and by the time he had escaped from under the pile of baggage, which, he well says

"must have been in less than five minutes [it appears to have been three], although it seemed an age, the women were yelling inside the coach, and the fire had enveloped the whole car. The coach was right side up, but the seats seemed to be broken up inside, and the passengers seemed to be pinned to the seats."

What the heaters were is not distinctly stated, and it is to this extent a minor matter, that probably no heater will ever be devised which will insure safety under such circumstances, and certainly none is in use; but it appears from the accounts that the heating arrangements were of a most inferior class as respects safety, common stoves, and the pathetic and heartrending details of the consequences may well cause every railroad officer to ask himself, "Am I also negligent?"

"The victims struggling in the wreck could be plainly seen by the light of the flames. One women, large and stoutly built, could be seen making frantic efforts to free herself from the broken timbers that held her to the floor of the car. She was unsuccessful, and her struggles and awful screams were soon stopped by death. One beautiful young lady succeeded in raising her head and the upper part of her body above the wreck. Standing surrounded by flames for a minute or two, she stretched out her arms and called in piteous tones for aid, and then fell forward dead. An old man, with white hair and beard, pushed his head and one arm through a hole in the roof of the car, called out that he knew he must die and wanted a message taken to his 'poor old wife,' but neither his name nor his address could be learned, and in less than a minute his hair and head were in flames and his awful cries were silenced by death. Two children, one aged 4 years and a babe 8 months old, were handed through a broken window by their heroic mother, who was wedged in the seat awaiting death from the flames which enveloped her. The men on the outside who received the children tried hard to rescue the mother, but to no avail. The heat was terrific, and they finally had to abandon their attempt, leaving the unfortunate woman who had saved her two children to her fate. The brave mother saw there was no hope for her. She gave the names of her children, and that she was the wife of Conrad H. Scherer, a dry goods merchant, at Winona, Minn."

In all some 20 persons appear to have been in this car, according to the latest accounts, all but three of whom were burned alive, while six more were seriously injured, one of whom escaped from the burning car in spite of a broken arm.

We have no belief, as we have said, that any means whatever can be found to wholly eliminate the danger of such holocausts so long as fire is carried on the cars at all. The simple substitution of boiler iron for cast-iron stoves would probably save a great deal, and certainly it is not too great a price to ask and demand for the measure of safety attained, albeit it is not too great. Suspended heaters outside the car are probably safer on the whole than any mode whatever of interior stove heating, and as they save useful room inside and take up none outside, and as it is a more natural way of heating, since heat tends to rise, it is strange that no one has succeded in bringing them into greater prominence. Still safer are the heaters which have been to some slight extent introduced, where a fire is carried only in one end of the baggage car. Still safer yet are heaters which use steam from the locomotive. The elevated railroad cars in New York are thus heated, and well heated, by live steam from the locomotive, and it may well be that the difficulties in the way of more general use of the system are more imaginary than real. This system is used in Russia, we believe, with entire success, although probably with lighter trains than ours. For all the bad success which has attended efforts of the kind so far, it is reasonable to hope that some device of this kind may eventually become the standard, and the prospect is good enough to make it a moral duty to lend every reasonable assistance to perfecting them.

In the mean time, it can be rationally demanded of every road that at least the ways of carrying fire on each car shall be the safest known. Cast-iron stoves such as ornament most baggage cars are simply murderous. The ordinary passenger car stove is little better. The various boxed heaters are a long advance on them, especially when provided with the Winslow safety tank, which would have been of no use in this particular case, but which may be and has been of the greatest use in case of overturning. Exterior heaters are probably the safest of all, and the one now largely used on the Reading Railroad, which is wholly of wrought iron, would probably have saved all the horrors of this disaster had it been in use. Even good boiler iron stoves might well have saved them.

It would seem as if it should not be beyond the reach of inventive genius to devise some way by which a very violent shock or breakage of any kind should discharge a flood of water or carbonic acid gas into the fire-pot and thus extinguish the flames at once, although the difficulty is that the heat in the coal could not be destroyed at once, as the flames could, and the mischief, if there is to be any, is done almost instantaneously. Even exterior heaters, while safe in some cases, might well be the most dangerous of all in others, nor does it appear that in this case, or in most others, fire-extinguishers, even if carried on the cars, as various newspapers vehemently urge, would have been of any real use. The emergency is too sudden and too great for dealing with it in such squirt-gun fashion. The heater problem reduces itself to good wrought-iron heaters if car heaters must be used, and to heating by steam from the locomotive by all means, if possible.

But the surest of all remedies is to strike at the root of such disasters by removing the cause. Passing for the moment the most immediate and the most discreditable defect in the appliances in use (discreditable because the general use of main line stub switches and common car stoves has been continued for an unwarranted and unnecessary length of time), there were at least two other contributing causes of a remediable nature, without which the disaster could not have occurred.

The first was the fact that the switch signals were so placed that they were entirely hidden from sight by the cars on the side-track, until the engine was within three car lengths. This, we fear, is a very common state of things, and it is obvious that if it is important to protect the switch by signals at all (which no one questions), it is important to place the signals so that they can be seen above all ordinary obstructions. This can be accomplished either by a switch signal high enough to be seen above the tops of cars, or by simple and inexpensive interlocking apparatus, which causes the display of distant signals. As there is every probability that on lines of the importance of the Chicago main lines such appliances would save their cost even in money, there is no reasonable warrant for longer neglect to make a beginning at least toward their general use. Where limited trains are run at very high speed with few stops, the special precautions taken on first-class lines should be observed. A road that can afford to run limited express trains should be able to afford some expenditure in safety apparatus, and one of the simplest, cheapest and most essential safety apparatus is a switch light or signal indicating the position of the switch to the engineer of an approaching train when he is at least 1,500 ft. away.

Probably trains have to pass switches at some speed several million times in the year, and if the average fallibility of mankind is such that only one switch in one million is left open, the number of accidents would still be considerable. The remedy is to show the engineer of the approaching train the position of the switch in a clear and unmistakable manner.

In some cases this can be done by combining a signal post and a switch stand in a cheap and simple apparatus, so that a light elevated some 20 ft. or more above the ground shows clearly the position of the switch. The switch handle cannot be moved without at once affecting the light, which should show danger until the movement of the switch is completed and the handle is again in such a position that the switch cannot be accidentally opened.

Such an apparatus is made by several firms in this country, and though not perfect or applicable to all situations would save many accidental derailments.

If it is impossible to give sufficient warning by the adoption of such a device, a more expensive arrangement may be used, and the switches interlocked with main and distant signals on elevated posts. It is not necessary to place the locking frame indoors, though it is generally advisable to do so, but a simple outdoor locking apparatus is better than none at all. Where the station or switch is approached on a steep down grade, as in this case, or by a curve in a cutting, a distant signal is really essential to the safe working of a

fast train. The expense of erecting one on a high post at every important point is only a fraction of the loss by a single accident like this.

The second remedy referred to is of an even more definite and positive nature, and far more inexpensive. The root of the difficulty in nearly all cases of misplaced switches is that some one has thrown the switch wrong for main track and forgotten to replace it. In part this is remediable by more thorough discipline, but discipline alone will never be a thorough guard against it. There is, however, one simple and absolute check, that after the switch has been unlocked it shall not be possible to remove the key until it has been relocked in main line position. This involves certain inconveniences, which the happy-go-lucky brakeman is apt to object to, but it is SAFE, and until the danger of misplaced switches is otherwise better guarded against than now, it is a safeguard which ought not to be absent.

But THE moral of this particular disaster, as we said before, is that the use of the dangerous stub-switch is unwarrantably common, which seems the more strange when we remember that there is really nothing appreciable saved by using it when the three-throw crotch-frog plan of switch is likewise in use. The two frogs are the same; the leads are the same, and the work on the two pairs of point rails is very nearly covered by the cost of the crotch-frog, and the labor and waste of rails required for putting it in. The Western roads, or most of them, should awaken to the fact that they are behind the age in their practice in this matter, which is in many respects an unusual and unnatural position for them to occupy.

CHICAGO CATTLE AND BEEF SHIPMENTS.

The shipments of live stock and fresh meats from Chicago eastward last September, by all lines except the Chicago & Atlantic, were 81,401 tons, while the shipments of other freight in the same month were 148,737 tons, so that the cattle and beef were equal in weight to 54.7 per cent. of the other freight, and at regular rates the gross earnings on the cattle and beef must have been very nearly as large as on the other freight, and the net earnings larger; but rates were probably cut more on live stock than on other freights, and we cannot venture to say what they actually were.

The total shipments of live stock, etc., were larger than in any other month of the year, and larger than in any month of last year except October. The chief cause of variation in the shipments from month to month is the varying numbers of live hogs taken to Eastern packing-houses. Compared with last year, the shipments this year were 6,403 tons (8¼ per cent.) greater besides the unreported shipments by the Chicago Atlantic, which, when it reported, had about 10 per cent. of the live stock, but, we believe, little or no dressed meat.

The shipments of live cattle and dressed *beef* in September were, in tons:

	1886.	1885.	Increase.	P. c.
Cattle	33,871	31,105	2,766	8.9
= beef	19,306	17,730	1,576	8.9
Dressed beef	27,782	21,634	6,148	28.4
Total beef	47,088	39,364	7,724	19.6

What is most remarkable here is the great increase in the total supply of beef sent to the East from Chicago—nearly one-fifth in one year. As comparatively little is exported, and not any more this year than last in September, this would indicate an enormous increase in the consumption of beef, if the whole supply came from Chicago. As there are now fewer men out of employment than there were a year ago and incomes are generally larger, there may have been a great increase, this being the costliest meat food, which is given up for salt beef, bacon, etc., when poor people have less to spend; but again, Chicago is not the only shipper of cattle and beef, and the other markets may not have increased their shipments in the same proportion.

In every month of this year except August and September the Chicago shipments of live cattle were less than last year. The increase in live cattle in the months named, however, was much less than the increase in dressed beef. In September, we see, of the whole increase in the supply of beef about four-fifths was forwarded dressed.

For the nine months ending with September the shipments of live cattle and dressed beef have been:

	1886.	1885.	Inc. or Dec.	P.c.
Cattle	268,879	303,792	— 34,913	11.5
= beef	153,261	173,161	— 19,900	11.5
Dressed beef	209,724	163,871	+ 45,853	28.0
Total beef	362,985	337,032	+ 25,953	7.7

Thus, while the shipments of cattle decreased one-ninth for the nine months, those of dressed beef increased 28 per cent. Of every thousand pounds of beef going from Chicago, 514 lbs. were shipped on the hoof last year; this year, only 422 lbs.

The dressed beef shipments last September were larger than in any previous month—1,591 tons (6 per cent.) more than in August, and 1,235 tons more than in July (when also they were larger than ever before), and 6,248 tons (28 per cent.) more than the average monthly shipments of the six months ending with June last, which is a remarkable gain to be made in so short a time. The dressed beef shipments did not increase much in the first half of this year, having been, in successive months, in tons:

Jan.	Feb.	March.	April.	May.	June.
22,328	21,431	18,892	20,176	23,163	23,213

They were much larger than last year, and the cattle shipments much smaller; but in the three months since June there has been a large increase in both cattle and beef shipments. The cattle, which had averaged 28,095 tons per month (= 16,014 tons beef) in the first six months of this year, have averaged 33,437 tons (= 19,059 tons beef) in the last three months; and the dressed beef averaged 21,534 tons in the first six and 26,840 tons in the next three. Thus the total supply, which up to July 1 had been 37,548 tons per month, has been 45,899 tons since, an increase of 8,351 tons, or 22 per cent., per month, of which increase 36½ per cent. has been shipped as cattle. Out of every thousand pounds shipped from Chicago, 574 were dressed beef in the first six months and 585 in the last three months. Thus, while both cattle and beef shipments have increased, beef has increased most. The most notable fact, however, is the great increase in the total shipments.

To ascertain whether such an increase is usual at this season, we compare with the shipments for the corresponding periods of last year, when the shipments were, in tons, per month:

	6 mos. to June 30.	3 mos. to Sept. 30.	Inc. or Dec.	P.c.
Cattle	35,456	30,352	— 5,104	16 8
= beef	20,210	17,301	— 2,909	16.8
Dressed beef	16,119	20,385	+ 4,266	20.9
Total beef	36,329	37,686	+ 1,357	3.6

Thus last year the shipments in the last three months were but 1,357 tons per month larger than in the first six months; while this year they were 8,351 tons greater in the last three than in the first six months.

While this does indicate a considerable increase in consumption, it must be remembered that the change from cattle to dressed beef tends to increase the proportion of the whole supply that comes from Chicago, because there are many places which ship cattle, while Chicago is the only one which ships very large quantities of dressed beef—at least a much larger part of the total shipments of dressed beef than of cattle go from Chicago. It is altogether improbable that the total beef consumption of the country is a fifth larger now than it was four months ago, as the Chicago shipments by themselves would indicate.

What the effect of the difference between the dressed beef rate and the cattle rate is having on the shipments it is impossible to say now, because rates are so irregular that we cannot know what the actual difference is. The great cattle carriers, however, are now carrying also large quantities of dressed beef, and this inclines them to make the difference such that they can keep both traffics, and the difference in the regular tariffs established March 1 last was intended to have this effect.

The total tons of live stock of all kinds and fresh dressed meats of all kinds shipped from Chicago for the nine months ending with September were 680,138 tons this year, against 630,815 last year, showing an increase of 49,323 tons, or 7.8 per cent., notwithstanding the lighter weight of the dressed beef substituted for the live cattle. The gross weight of the cattle and beef shipments was, however, 10,940 tons more than last year. Most of the remainder of the increase has been in live hogs. These shipments are more important than any other rail shipments from Chicago, and the increase in them does something to offset the great decrease in the flour and grain shipments by rail.

The Ohio & Mississippi.

The Ohio & Mississippi Railway report for the year ending with June last shows a very much larger freight traffic than ever before, but at rates more than 30 per cent. below the average of the previous five years, while the passenger traffic was the smallest since 1881.

The traffic in *millions* of passenger and ton miles has been:

Millions of—	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Pass.-mile.	39.1	46.1	52.9	64.5	67.5	73 8	64 8	57.4
Ton-miles.	208.6	247.3	282.9	179.2	200.6	224.9	253.2	319.0

The fluctuations in the amount of traffic have been unusually great for an old railroad without change in mileage. Thus the passenger traffic increased 60 per cent. from 1880 to 1884, and fell off 22 per cent. from 1884 to 1886; while the freight traffic was larger in 1881 than in any other year until this year, and fell no less than 37 per cent. from 1881 to 1882, and this year was 78 per cent. more than in 1882 and 26 per cent. more than last year.

The rates are now among the lowest received by any railroad so far west, and as low as on the trunk lines. In cents per passenger and per ton per mile, they have been:

	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Pass.-mile	2.38	2.36	2.35	2.22	2.19	2.00	2.05	2 07
Ton-mile	0.99	1.09	1.04	1.17	1.00	1.05	0.81	0.70

It is surprising to find that the average freight rate was an eighth *less* this year than last, though through rates were at the lowest in nine months of the 12 to June 30, 1885, and in only three months of the last fiscal year. The average *through* rates certainly were higher this year than the year before, though they were not always maintained at the agreed figures, and possibly less so at St. Louis than elsewhere. But this company's last fiscal year was coincident with last winter wheat crop year, and winter wheat is the great crop on its lines in Illinois, and probably in Indiana also. In these states, and in Illinois particularly, this crop was a failure last year. In Illinois the production was but 10.7 million bushels in 1885, against 32.4 in 1884; in Indiana there were 26.7 millions in 1885 and 33.7 in 1884, the failure being most complete in the southern parts of those states. The natural effect of this was to reduce the local traffic, which pays the highest rates; so that the average rate was nearer the through rate than in almost any other year, probably. Further evidence of this is the fact that the average distance this freight was hauled increased from about 180 miles in 1884–85 to 200 miles last year. This, however, makes the great increase in traffic the more astonishing, and indicates that it must have obtained an unusually large share of the through freight, for the total amount of that freight to and from St. Louis and Louisville was not remarkably large in that year. The profit on such a rate must be extremely small, the average train load not being very large, as on the Erie and many other lines further east which have a large through traffic.

The earnings and expenses of the company have been:

	Earnings. Pass.	Freight.	Total.	Expenses.	Net earn
1879	$928,501	$2,064,465	$3,197,567	$2,364,625	$832,942
1880	1,086,303	2,686,608	4,005,497	2,725,236	1,280,261
1881	1,243,336	2,959,350	4,435,715	3,316,058	1,119,657
1882	1,432,552	2,099,345	3,832,573	2,987,960	844,613
1883	1,475,771	2,631,748	4,375,748	3,254,383	1,121,365
1884	1,478,921	2,379,626	4,139,437	3,283,401	856,036
1885	1,330,948	2,063,548	3,645,467	2,670,736	974 731
1886	1,191,590	2,227,255	3,671,920	2,597,708	1,074,212

The increase in freight earnings and the increase and decrease of freight earnings from different years to 1885–86 have been:

	Inc. in traffic.	Inc. or Dec. in earn.
1883-84 to 1885-86	4⅔ p. c.	Dec. 6 4 p. c.
1882-83 " "	22 "	" 15.3 "
1881-82 " "	78 "	Inc. 6.1 "
1880-81 " "	12⅝ "	Dec. 24 5 "
1879-80 " "	29 "	" 17.0 "

This is one of the striking instances of the way in which railroad companies are compelled to work for the benefit of the public. In 1880 the Ohio & Mississippi carried 46 million passengers and 247 million tons of freight one mile at an expense for working of $2,725,000, and made $1,280,000 for interest on the investment. Last year it carried one-fourth more passenger traffic and 29 per cent. more freight traffic, at an expense smaller by $127,500, but it made only $1,074,212 for interest on its capital. It had carried 11 millions more of passengers and 72 millions more of tons one mile without increase, but with a decrease, in expenses, and the public got this additional traffic carried for nothing, had all the saving in working expenses, and $206,000 more, or nearly one-sixth deducted from the income of the proprietors of the railroad. Counting a passenger mile equal to two ton-miles, the expense of carrying a ton of freight 200 miles over this road (the average haul this year) has been reduced from $1.60 to $1.20, or 40 cents; but the charge has been reduced from $2.18 to $1.40, or 78 cents—nearly twice as much as the reduction in the expense. There is no standing still, satisfied with things as they are, for a railroad company, for things will not stay as they are. Rates go down in spite of all efforts, and if something is not done to reduce expenses, profits are swept away in a very short time. If the expense of doing a given amount of work had been as large on this road in 1886 as in 1880, its working expenses would have been only $200,000 less than its gross earnings, and the net earnings would have been reduced 81 per cent.

It seems to be impossible to make a reasonable profit on investment in railroads which like this cross the state of Illinois from east to west south of Chicago. The state is gridironed with them, but neither the Wabash, the Indiana, Bloomington &

Western, the Indianapolis, Decatur & Springfield the Indianapolis & St. Louis, the Vandalia Line, nor the Ohio & Mississippi makes its stockholders happy. Some of them doubtless have excessive capital accounts, but the net earnings of the Ohio & Mississippi last year, when they were above the average of the last eight years, were only $1.743 per mile, or 6 per cent. on $29,059 per mile. The interest on its bonds, most of which pay 7 per cent., amounts to within $50,000 of last year's net earnings.

The showing made, indeed, is not very encouraging to the proprietors. Profits continue small in spite of a great increase in traffic and a considerable decrease in expenses.

Until May last its gross earnings were less than last year, but since they have been considerably larger, and in the first three months of the new fiscal year, July to September, there has been an increase of 16½ per cent., so that there is a prospect of improvement.

The Boston & Albany.

The Boston & Albany Railroad shows the effect of the high freight rates very decidedly in its report for its last fiscal year, ending Sept. 30 last. Notwithstanding a slight decrease in the freight traffic, it had an increase of no less than one-seventh in its freight earnings, this increase alone being equal to $2.66 per share of stock. There was also an increase of more than 7 per cent. in the passenger earnings, but this was due almost entirely to an increase in passenger traffic, which has grown very rapidly and uninterruptedly on this railroad since 1879—much more so than the freight traffic. The traffic has been for eight years, in *millions* of passenger and ton miles:

Million of	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Pass.-miles..	101 2	112.7	135.4	151 3	157 3	167 4	167.1	177 8
Ton-miles ...	325.5	375.5	417.1	374.3	373 6	374 3	398 9	390 5

From 1879 to 1886 the increase in passenger traffic was 76 per cent., while the increase in freight traffic was but 20 per cent. But the average passenger rate has decreased largely and the freight rate not at all, which is very unlike the general course of rates. The passenger earnings last year were but 14 per cent less than the freight earnings; in 1880 they were 48 per cent. less. Thus the passenger business is becoming relatively more and more important. Last year it was 6 per cent. more than the year before, and much more than ever before; while last year's freight traffic was exceeded as long ago as 1881 as well as in 1885. In fact, the freight traffic since 1879 has been almost stationary, varying only from 374 to 417 millions and averaging 386 millions, which is but four millions less than last year's freight traffic. Last year's freight earnings were exceeded in 1880, 1881 and 1883, but not much, the rates having been maintained wonderfully well. The average rate received, in cents, per ton and per passenger per mile has been:

	1879.	1880	1881.	1882.	1883	1884.	1885	1886
Pass.-mile.....	2 14	2.08	1 97	1 99	2 09	1 91	1.84	1 85
Ton-mile.....	1.10	1 21	1.04	1.07	1.19	1.09	0 94	1.10

The average passenger rate has decreased, but the average freight rate for the eight years has been slightly less than the rate last year.

While the company's gross earnings increased $660.751 (8.7 per cent.) last year, with an increase of less than 2 per cent. in traffic, the increase in net earnings was but $144,039 (6 per cent.), there having been an increase of no less than 10 per cent. in the working expenses, which were larger than ever before, except in 1883. As the expenses were exceptionally small in 1885, being 8½ per cent. less than in 1884, in spite of an increase in traffic, we may suppose that the expenses were made unusually large last year because they were not large enough the year before. It is customary with this company, however, to pay for improvements and additions to the property out of earnings. The law of Massachusetts limits its dividends to 10 per cent., and it does not appear to be politic to pay more than 8, and sometimes the profits are a good deal more than this. The apparent surplus last year, however, was not quite 1 per cent. on the stock.

The gross earnings of this railroad were larger last year than in any other except 1883, and the net earnings were exceeded only in 1879, which was the year of *smallest* gross earnings. But it can hardly be said that the profits have shown any tendency to grow. Before last year for eight years the average net earnings had been $1.898.293 per year, and the years in which they exceeded that amount were 1879, 1880, 1883 and 1885. But the fluctuations in its net earnings have been very great, they being $2,350,330 in 1879 and $1,582,947 two years later, the decrease of $767,383 being equal to 3⅝ per cent. on the capital stock. Then in two years they increased 22½ per cent. This is probably in part due to the varying amount of earnings spent for construction but charged to expenses.

The Paris Railroad Exhibition.

As will be seen by his official circular, elsewhere published, Mr. John W. Weston, whose office is at No. 230 La Salle street, Chicago, has been appointed Commissioner General for the United States of the "International Railway Exposition and Congress," to be held in Paris from May to October, next year, as we have heretofore noted. All kinds of railroad apparatus and appliances are to be exhibited, and we could add immensely to the variety, interest and value of the exhibition by sending samples of our constructions and appliances. As few of these of our manufacture are used on European railroads, the motive which made the exhibition in Chicago, in 1883, so great and so excellent will be lacking; for the large expenditures required are not likely to be incurred by manufacturers unless there is hope of increasing sales thereby; but it ought to be possible by the co-operation of exhibitors, including railroad companies as well as manufacturers, to make an exhibition which will be fairly illustrative of American railroad practice, and be creditable to the nation. A modern American freight train, with one of our most powerful locomotives and power brakes, would probably be as interesting to European railroad men as anything in the exhibition; but we shall probably have to be content with sending sample cars instead of a whole train. Blank forms, etc., illustrating the clerical work connected with our freight transportation would be extremely interesting to a class of railroad men which is much more numerous there than here, and would certainly astonish them. An American railroad station of the one-man power class in full operation at the exhibition would also startle them and be as characteristic, perhaps, as anything we can show. If we send only what we can sell abroad, our exhibition will necessarily be very uneven and illustrate only a few details of our railroad practice. But if we do much more, it will probably be due to the patriotism and pride of the great manufacturers and the railroad companies themselves; and the latter are not likely to do anything worthy of the country unless they co-operate. If they did this under a competent head, they might provide a very fine exhibition without great cost to any one of them, and have it shown by competent attendants—a matter of prime importance. But it is so difficult to get the companies to co operate in matters seriously involving their direct pecuniary interests, that we have little hope that they will do so in this. They certainly will not unless some one takes the initiative in a very vigorous way.

It will be easier to select delegates who will represent the country adequately in the Railroad Congress. As many as possible of these should be able to speak French, and papers to be submitted at the Congress should be translated into French.

This is the great railroad country. Our mileage is greater than that of all Europe, and we have adapted railroads to almost all imaginable conditions; and a railroad exhibition with the United States unrepresented or very imperfectly represented, if not like the play of Hamlet with Hamlet left out at least will lack very much of being a universal exhibition, such as this is intended to be.

The Master Car-Builders' New Standards.

As will be seen from an illustrated article in another column, four new standards have been added to the now long list adopted by the Master Car-Builders' Association: a standard dead-block casting a standard for double dead-blocks, a standard wheel-tread and a standard brake-shoe. One standard was emphatically rejected, the proposed standard height for passenger car draw-bars of 34½ in.

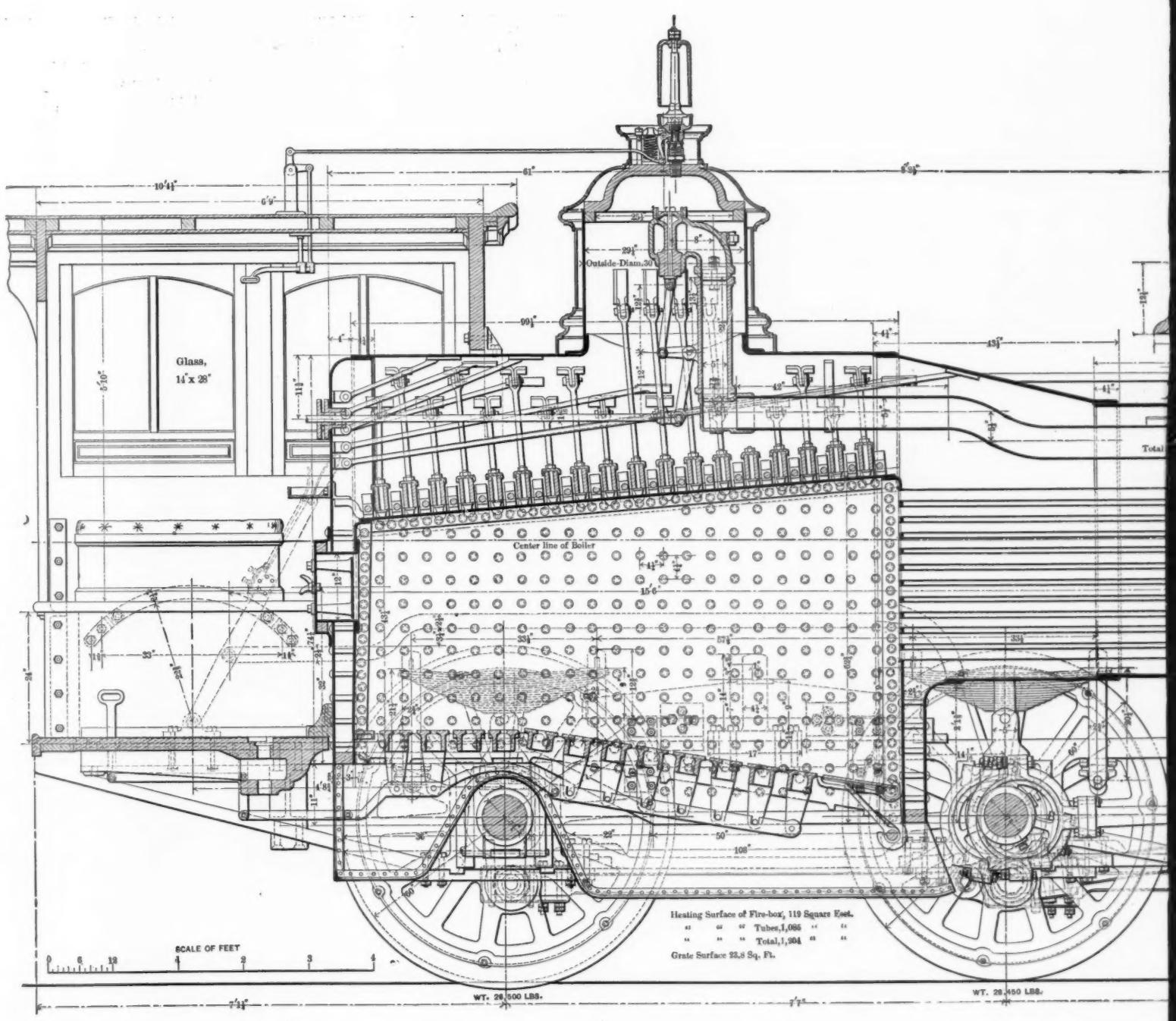
The actuating motive for the latter was probably, in good part, that it was regarded as an entering wedge for a change of freight car standard to the same figure, which was so emphatically "sat down upon" in the last convention that it was not even allowed to go to letter-ballot. The feeling of the convention evidently was that the Association would be stultifying itself by the proposed action, punishing those who had done their duty by making one change at their request in the interests of uniformity by compelling them to make another, in order to reward those who had shown no readiness to make even one change in the interest of uniformity. The attempt to show that there was any valid mechanical objection to the height which has so long been standard was evidently looked on as rather "thin." The question of a passenger standard is a somewhat different one, to this extent at least, that the existing standard is far less generally used in passenger than in freight stock, but the action had clearly indicates that the Association as a body does not mean to countenance any change whatever in this standard, for the present at least, nor does it now appear likely that it ever will.

The modified wheel-tread section which has been adopted follows exactly the suggestion of the *Railroad Gazette* that the cylindrical part of the tread formerly proposed should be given a slight cone, without further change. By it the former vote of 233 ayes to 145 noes (not two-thirds) has been increased to the more nearly unanimous vote of 411 to 91. There can be no doubt that the changed tread is at least a more prudent one to adopt, if not a better one. No one could tell exactly what would be the effect of entirely cylindrical treads, and there was at least a chance that the motion of the wheels would be unfavorably affected, while it was certain that their motion over frogs would be worse than with the revised form. There is grave reason to question whether it was wise to adopt the small fillet radius of ⅝ in. in place of the ¾ in. radius, which has heretofore been more usual, but the difference is not great, and probably no serious harm will result.

The two new dead-block standards are unquestionably desirable additions to the list. There is no possible reason why any difference of practice in respect to these details should be desired or adhered to, unless temporarily for special reasons. In respect to the new standard brake-shoe, the case is not so clear. If there were any reasonable hope that all the dozen or twenty brake-shoes in use would be abandoned in favor of the Christie, it would be much clearer. As we take it to be undoubted that there is no immediate prospect of any such happy result, however, the question naturally arises: Is it better to have one "standard" and a dozen other similar devices in use which are not standard, or, by giving every one a choice between two or three standards, practically to insure that one or the other of them, or all three together, shall be in practically universal use? We fear that not enough attention has been paid to the lesson which may be learned from the fate of these standards after they have been adopted, which certainly tends to indicate that in the effort which is still vigorously continued to have every detail of car construction reduced to one single universal type for the whole country, the Association is acting unwisely, in that it is attempting the impossible. Supposing some action like this were taken: that any truck or detail or part thereof, or any part of car-bodies, other than couplers and appliances involving the safety of trainmen, which was shown to be in use or about to be put in use on not less than 50,000 to 100,000 cars, should on proper application be declared a standard of the Association? Would not that be doing really more to bring about the desired end of practical uniformity than to continue to labor indefinitelry to bring about a nominal agreement on single standards which it is a patent fact that a great many persistently continue to disregard? The question thus raised is a large one, which we cannot go into further just now, but it is one which, in view of the past history of the nominal standards, is well worth consideration. Of course, on such a question as the height of draw-bars no compromise is possible. It must be one standard or none; but there are many details, like brake shoes, journal boxes and axles, in which, if we can reduce confusion worse confounded to two or three standards to be kept on hand for repairs, we have accomplished the desired end almost as fully as if we had one standard only, and we have accomplished it far more completely if in the one case we have taken action which will ACCOMPLISH its end, and in the other not, as so far it certainly has not.

The pressure on our columns of matter that cannot well be postponed is too great to permit of our publishing this week the somewhat voluminous final records of the results of the Burlington brake tests, which really contain the pith of the whole matter, and should be given together. As we cannot give it all, it seems better to give none.

We print in another column a very seasonable suggestion from one of our best-known wheel makers. Common sense would indicate that in changing from chilled wheels to steel tires, as far as possible the same standard sizes should be adhered to. But as the steel tire can well stand a wear giving a difference of some three inches in diameter, it is obvious that the standard sizes of steel-tired wheels should have regard to their mean or average diameter when half worn out. Thus a steel-tired wheel measuring when new 33 in. on tread will really during its life have an average diameter of 31½ in.; and when worn out will only measure 30 in. diameter. It would, therefore, be better, as suggested by Mr. Snow, to adopt such a scale of standard sizes for steel-tired car wheels that during the life of the tire it will never differ by more than 1½ in. from the usual standard sizes of chilled wheels.



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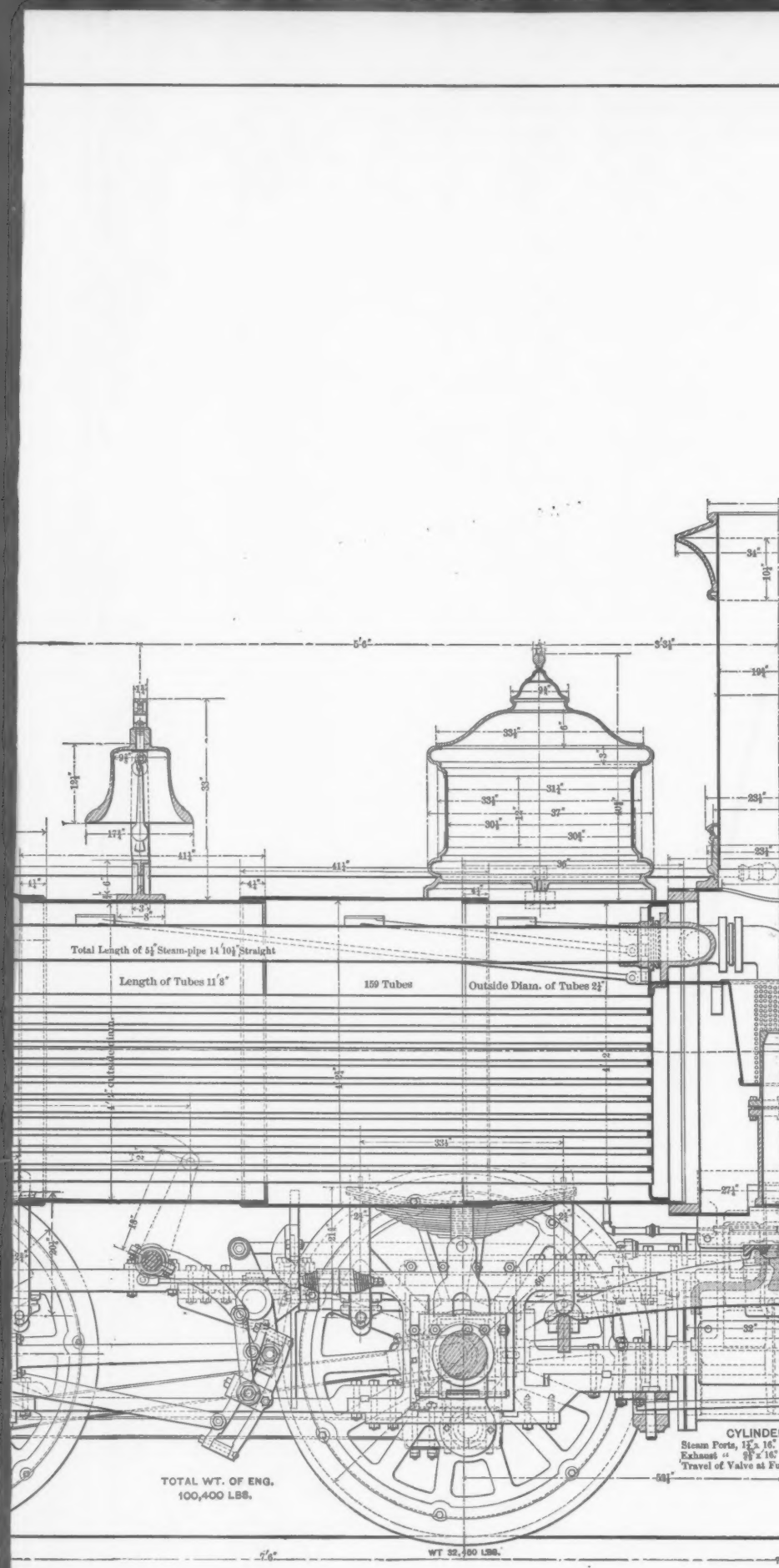
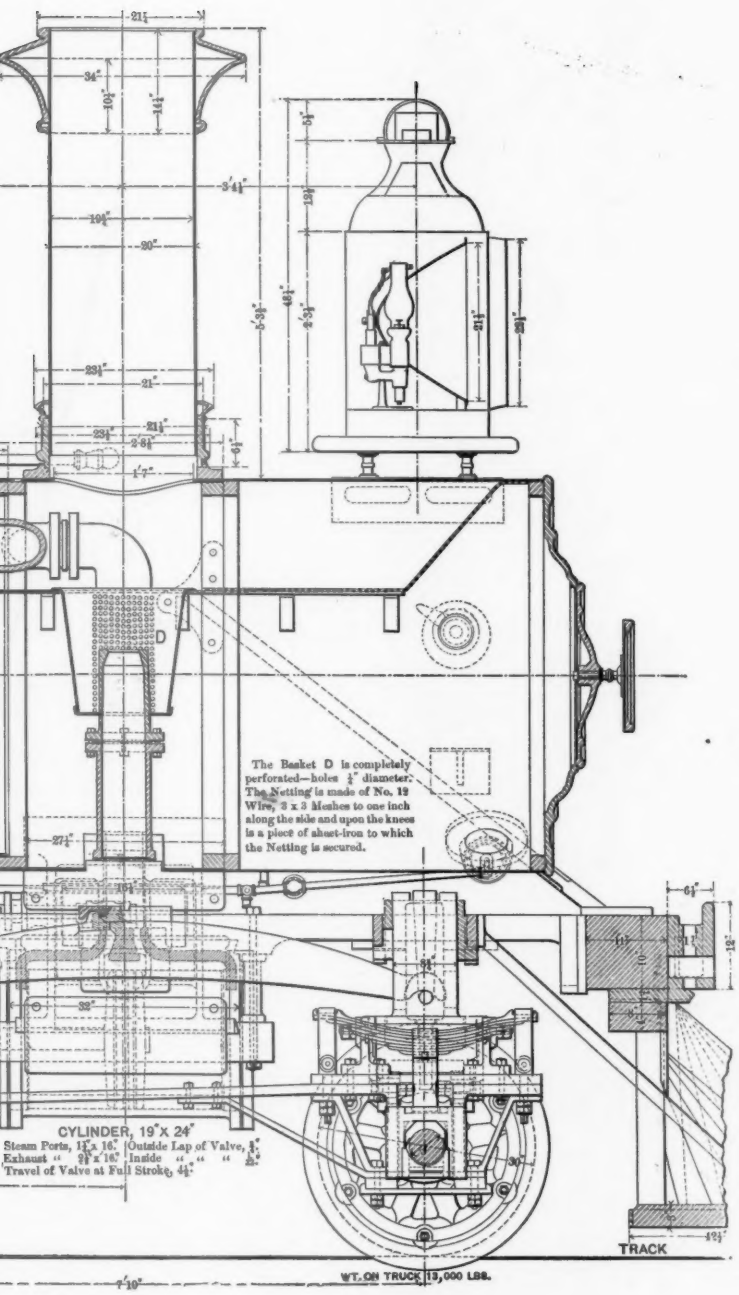


TIVE, BALTIMORE & OHIO RAILROAD


The Basket D is completely perforated—holes ¼" diameter. The Netting is made of No. 12 Wire, 3 x 3 Meshes to one inch along the side and upon the knees is a piece of sheet-iron to which the Netting is secured.
CYLINDER, 19"X 24"
Steam Ports, 13" x 16" Outside Lap of Valve, 1"
Exhaust " 2½" x 16" Inside " " "
Travel of Valve at Full Stroke, 4½"
TRACK
WT. ON TRUCK 13,000 LBS.

The enormous difficulty of securing unity of action among a large number of railroad companies even with regard to some matter in which their interests are almost identical—as in the matter of uniform time standards, for instance—has often been remarked. In the associations for maintaining uniform through rates, this is especially manifest; for though it is for the interest of all that rates should be maintained, it is for the interest of each that its share should be as large as possible, and out of a large number of companies there is likely to be one or more whose management believes that it can make more outside of the association than it can in it, as it usually could if in spite of its abstention the other lines would combine and maintain their rates. To induce a number of competing companies to co-operate is at best a difficult task, and its difficulty increases with the number of managements and of interests to be harmonized—with the square of the number, we are inclined to say.

The work of the Central Traffic Association, which Mr. Geo. R. Blanchard has undertaken to direct as Commissioner, is thus in its nature extraordinarily difficult. There are forty railroads in it, and these are complicated with connecting railroads in such a way that they cannot easily control the rates at their Western termini. There are said to be no less than 570 junction points in the territory of the Association, and they are increasing every year. The connecting points with lines west of the field in which the Association endeavors to control rates have multiplied to such an extent that well-maintained pools at the great traffic centres like Chicago, St. Louis and Peoria will not prevent a very large part of the traffic interchanged with roads further west from slipping through by one of these junction points at a cut rate. All these things must be provided for if the Association is to be successful, and probably in time and with the co-operation of the Eastern trunk lines they can all be provided for; but we must not be surprised if the results are at times unsatisfactory, especially if, as now, the Eastern trunk lines themselves fail to give a firm foundation on which their Western connections may build.

This is brought to mind by the very interesting address of Mr. Blanchard to the managers of the Central Traffic Association, Oct. 20 last, which gives much valuable information concerning the past working of the Association and its present difficulties, and makes some important recommendations, some of which we have noticed heretofore. Other parts of the address we hope to consider hereafter.

The application of the trustees of the Houston & Texas Central first mortgage for an order of the Court to sell 283,200 acres of the state land grant which form part of the security for these bonds *before Nov. 20 next* is only one more and perhaps the most striking instance of the manner in which the interests of this company's bondholders have been neglected by those responsible for its management. The reason given by the trustees for this application is that the authorities of the state of Texas claim that by the terms of the land grant one-half of the lands were to be sold by the company within 14 years from the date of their acquisition, and that that time will expire Nov. 20. If this is a condition of the land grant, what is to be said of the management of the company, which held on to so large a part of the lands until within a few years of the date; still more, what is to be said of the conduct of the receivers, and, most of all, what is to be said of the conduct of the trustees of the first mortgage, in whose special custody lies the protection of the interests of the bondholders, and who waited until only *four weeks* remained before the date of forfeiture of the lands before taking any steps in the matter? There probably is not one bondholder who ever heard of such a condition in the land grant, which, unless the trustees were grossly negligent, must always have been familiar to them. In the time remaining before Nov. 20, it would simply be impossible to sell so large a body of lands for anything like what they are worth, or probably to sell them at all, except to some person or organization which has made preparation for just such an emergency for the purpose of depriving the first-mortgage bondholders of part of their security.

The trustees say in their petition to the Court, that they are advised that the claims of the Texas authorities are unfounded and cannot be maintained, but that as the Governor and Attorney-General of Texas declare that they shall insist on those claims and take proceedings to enforce them, it will tend to throw a cloud on the title of the lands unless they are sold before Nov. 20. That would have been a reasonable petition to make two or three years ago.

If such a sale is necessary, it should by all means be made subject to the lien of the first-mortgage bondholders. The land then probably would bring very little, but the bondholders would have their security; and as there is already $861,560 of interest overdue to them, they are entitled probably to the whole value of the land now, to say nothing of the security for future interest and the principal.

An inquirer in Chicago writes to ask us "If 3 in. elevation in a track on a 3-degree curve is sufficient for a speed of 60 miles per hour, is 1 in. elevation enough for a 1-degree curve at the same rate of speed? If not, why?"

We answer that we do not know, and we know of no one who does. The centrifugal force is directly as the degree of curvature, and if the only object of super-elevation be to balance and counteract this centrifugal force, as is usually taken for granted, then our correspondent's question must be answered yes. There is, however, another force, compared with which the centrifugal force of the fastest train is a bagatelle, which tends to crowd, and does crowd the outside flange of the slowest train against the outer rail, however much elevated, which has to be considered; viz., the tendency of the truck to run in a straight line and not in a curve. This force is independent of the degree of curvature, or very nearly so, since the truck must be continuously twisted, however easy the curve, and whether it be twisted fast or twisted slowly demands the same flange pressure in pounds, although a very different amount of WORK in foot-pounds. The elevation necessary to counteract this force would be far beyond the limits of possible practice, viz., from 1 ft. to 15 in. on *all* curves, sharp and easy. Inasmuch as whatever elevation there is tends to reduce this force, however, and diminish the flange pressure, there is plausible ground for the claim (which, be it understood, we do not advance as a fact, but merely as a suggestion) that the better practice would be to elevate all curves as much as would balance the centrifugal force of the fastest trains, and never less than 2 or 3 in. This would unquestionably improve the riding of fast trains, and we imagine that, in so far as it had any effect, it would diminish the resistance of slow freight trains. There is room for some good experimental work in this direction, which has never yet been done.

A few railroads have reported their October earnings thus early, showing:

	1882.	1883.	1884.	1885.	1886.
M., L. S. & W.	$86 708	$112,524	$103 837	$158 025	$251 552
C., M. & St P.	2,250,975	2 531 128	2,539,796	2,892,473	2,799 000
C. & N W.	2,60 ,445	2,793,991	2,523,843	2,878,409	2,884,500
Den & R G.	642,213	720,445	567 285	626,364	7 3 212
North Pac.	824,769	1,397 222	1,461 5 1	1,522, 85	1,487,144
St. L. & S. F.	369,: 06	370,160	512,758	486,386	5 5,317

The Milwaukee, Lake Shore & Western continues the enormous gain it has had in previous months of this year since lake navigation opened and shipments of ore began. The Milwaukee & St. Paul earned 3½ per cent. less than last year, but much more than ever before. The Chicago & Northwestern has a trifling gain over last year, a large one (14 per cent.) over 1884, but only a small one over 1883. The gains of the last two companies over last year in successive months have been:

	June	Ju'y.	Aug.	Sept	Oct.
C., M. & St. P	$198,813	$142,024	$ 06 089	$281.722 D.	$93,478
Chi. & N. W.	120,769	119,630	406,231	134,976	61.231

Thus the gain over last year was much less in October than in any of the other months, yet it cannot be said that October was this year a less favorable month than previous months, but rather that it was much more favorable than the previous months last year. Thus the *increase in October over September* has been:

	1882.	1883.	1884	1885.	1886
C., M. & St. P.	$300,265	$310,444	$338.555	$629,.96	$244,0 0
C. & N. W.	48 404	146,023	176.9 9	326.145	197.5 0

The increase from September to October was thus nearly twice as great last year as ever before, and this year, in spite of the fact that September earnings were unusually large, it was for the two roads together very nearly as large as in any year except last year.

The Northern Pacific, which has been having large gains, had a small decrease (2½ per cent.) in October, leaving the earnings larger than in any earlier year. This is the natural result of the unusually early marketing of the spring wheat, which made the earnings in August and September very much larger than ever before. The earnings of the three months ending with October have been:

1883.	1884.	1885.	1886.
$3,635,560	$3,7 0 673	$3,718,529	$4,174,902

Thus the earnings since harvest have been nearly 12 per cent. greater than ever before, and this season must be regarded as very favorable, even if there should be a decrease in November as well as October, which is not improbable, as the earnings were exceptionally large in November last year, and the movement of wheat to Duluth in that month was altogether unprecedented.

The St. Louis & San Francisco earned more this year than ever before, but the gain over last year was only $33,929 in October, against $93,743 in September, $87,340 in August and $91,973 in July, and an average monthly gain of $81,017 in the first half of the year.

The Denver & Rio Grande has the large gain of 12½ per cent. over last year, and earned more than in any other year except 1883, when the earnings of the 362 miles of the Denver & Rio Grande Western were included.

Pennsylvania Railroad Earnings in September.

Notwithstanding good gain in the gross earnings of the lines of this company east of Pittsburgh and Erie in September, the net earnings were less than last year, which will doubtless be disappointing to many, but as last year the net earnings in September were among the largest the company has ever had—exceeded only in October of the same year, in August and October of 1884, in three months of 1883, two of 1882 and two of 1876 (centennial travel), this year's net earnings must still be considered large.

For 14 successive years the gross and net earnings and expenses of lines east of the Pittsburgh and Erie in the month of September have been:

Pennsylvania Railroad Earnings and Expenses in September.

Year.	Gross earnings.	Expenses.	Net earnings.
1873	$4.039. 96	$..195,096	$1,844.100
1874	5,252.238	2..39,840	1.2 2,416
1875	3.571.057	1.807 504	1,673.5 3
1876	3,869,994	1.6 9 320	2,220,674
1877	3,000.408	1,471,691	1,5 4 717
1878	2.858.646	1,456,451	1.402.195
1879	3.336.529	1.745.891	1,590,638
1880	3 647.544	2,172,634	1 474,909
1881	3.7 5 0 6	2,271.829	1,463,177
1882	4 4 7.60	2 683. 76	1.734 426
883	4,634 999	2.712,645	1.922 364
1884	4.4 8 871	2..71,5.7	1,887 514
1885	4 276 628	2,384,658	1,894,970
1886	4.674 052	2,867,598	1,810,454

Thus the gross earnings of the month were larger this year than ever before, though but $39,000 more than in 1883. The working expenses were much larger this year than ever before, and larger than in any other month of any year except June of this year, June of 1883, and December of 1882. This leaves the net earnings smaller this year than in any other since 1882.

Compared with last year there is:

In gross earnings an increase of	$397 424,	or 9.3 per cent.
In expenses an increase of	47 ,940,	or 15.6 " "
In net earnings a decrease of	5.3.6,	or 4 0 " "

The very large increase in expenses is partly because the expenses were unusually large this year, but also because they were unusually small last year. As we see, they were then $328,000 less than in 1883; and this year they were $44,000 *more* than the average of the three summer months, while last year they were $168,000 *less* than the average of those months. The through rates last year were at their lowest, but the improvement in them probably made the smaller part of the gain in gross earnings, for the activity in the great manufacturing industries on this road, particularly in the iron industries, must have very greatly increased its local traffic.

The lines west of Pittsburgh and Erie have yielded the following surplus or deficit over or below all liabilities in September:

1879—Surplus	$345,688	1883—Surplus	$321,789
1880— "	222.018	1884— "	50,6?2
1881— "	214,1 3	1885—Deficit	0 2 6
1882— "	445,870	1886—Surplus	82,423

The Western system has always yielded a surplus in September except last year; it gains $172,649 over last year, but the surplus was much less than in any of the five years previous to 1884. It indicates that the capacity of this western system to yield profits has been permanently reduced (by the multiplication of railroads probably), when in spite of an unusually large crop movement at the time and much activity in manufacturing industries, this great system in August and September should yield a surplus over liabilities of only $152,094, while in the four years previous to 1884 it had yielded from $439,000 to $712,000. The fall months are the most profitable ones for this system, which usually has a larger surplus in October than in September, but the crop movement was unusually early this year, and in spite of that the profits were so small in August and September that any probable gains later in the year will make the surplus of the whole system but trifling for the whole year, and much less than we should have expected from the advance in through rates, and the activity in iron manufactures. This system has an immense traffic in the materials of the iron industry, and in its manufactures, carrying ores from Cleveland to Pittsburgh, and other points where there are blast furnaces, and carrying coke back and to the West. It has not now, however, nearly so large a share of the coke traffic as when the iron manufactures revived in 1879, and probably a smaller one of the other iron traffic, and probably rates are much lower now, for though about as much iron is made now as ever before, the prices of pig are very much lower than in 1879, 1880, etc.

For the nine months ending with September the gross and net earnings and working expenses of the lines east of Pittsburgh and Erie for ten successive years have been:

Pennsylvania Railroad Earnings and Expenses for Nine Months

Year.	Gross earnings.	Expenses.	Net earnings.
1 77	$22,006,256	$14.08 741	$7.9 7,515
878	22 81 9 8	13,534,111	9 285,807
1879	24,516,214	14 8 3,106	9 693, 08
880	30 2 3,6 7	17 8 7,3 2	12,426.305
1881	32,878,246	19 4 2 4,36	13 39.,810
1882	35 887,788	22,283,.80	13 6 4,506
883	97 892 916	23,816,384	14.0 76,532
1884	36,398,108	22 855,843	13 542,265
1885	34,236,640	22,0 5,664	12,220, 76
1886	36,837,242	23,89.,455	12,971 817

The gross earnings this year were exceeded only in 1883;

the working expenses were larger than ever before, but the net earnings were exceeded in each of the four years from 1881 to 1884, by amounts varying from $424,000 to $1,105,000. Compared with last year the increases are:

In gross earnings	$3,628,632,	or 10.9 per cent.
In working expenses	1,877,731,	or 8.5 "
In net earnings	1,750,861,	or 15.6 "

The gain in net earnings on this sytem is equal to 1.87 per cent. on the stock outstanding.

Meanwhile the surplus or deficit of the lines *west* of Pittsburgh and Erie has been:

1879—Surplus	$168,834	1883—Surplus	$894,318
1880— "	2 093,565	1884—Deficit	661,859
1881— "	2,268,783	1885— "	1,744,485
1882— "	1,067,772	1886— "	261,783

Thus, this Western system still shows a deficit for the year which may reasonably be expected to disappear by the end of the year. It is encouraging that it should be so much less than last year or the year before, but discouraging that the result should be so much less favorable than in any of the five years previous to 1884. In 1881 this system yielded in the nine months $2,530,000 more than this year—of itself equal to 2¾ per cent. on the stock now outstanding, and to 3¼ per cent. on the stock then outstanding.

Combining the surplus or deficit of the Western system with the net earnings of the Eastern system for the nine months we have as the income from both systems:

1879	$9,801,942	1883	$14,970,870
1880	14,522,870	1884	12,840,406
1881	15,664,593	1885	9 976 491
1882	14 672,278	1886	12,710,054

Thus the gain over last year is no less than $2,734,563, which is 2⅞ per cent. on the capital stock, but its income is a little less than in 1884, and from $1,812,000 to $2,954,000 less than in any of the four years from 1880 to 1883. Of the gain over last year, nearly two-thirds was made by the lines east of Pittsburgh and Erie, which last year had not quite one-half of the gross earnings of both systems.

Last year September was the last month when the gross earnings of the Eastern system were much less than the year before, August being the last month when the net earnings were much less. The gross and net earnings of the Eastern system and the surplus or deficit of the Western system for the *last three* months of the year have been:

	Eastern system.		Western system.		Income
	Gross earn.	Net earn.			from both.
1880	$11,005,457	$4,208,732	Surplus	$975 487	$5,184,209
1881	11.245,007	4.018.627	"	3 9,555	4,397,982
1882	13,191,117	4 824,986	"	826,528	5,651,514
1883	13,189 334	5.256,552	Deficit	71,649	5,184,903
1884	12,167,809	4,494,640	"	200,032	4,294,608
1885	12,377,392	4,911.297	Surplus	162,471	5,073,768

Thus in the last quarter of the year the gain in the profits of the systems was very large last year, and they were nearly as large as in any previous year except 1882. For this reason, it is not to be expected that the gains this year in these remaining months will be at as great a rate as in the months heretofore reported, and the result will be quite good should there be no gain at all. Business was unusually active in these months, but some of the conditions are more favorable this year, and moderate gains seem probable. But most of the gain of this calendar year over last year has doubtless been made already—was made before September,—for the gain in the profits of the two systems was less than $7,000 in that month, while for the other eight months it had averaged $341,000 per month. It is doubtful if the gain will be as much as that for the entire three months that remain to be reported, and a reasonable figure for the gain of the whole year is $3,000,000, which ought to be satisfactory to the shareholders.

Mr. M. N. Forney, who needs no introduction to the readers of the *Railroad Gazette*, will begin the publication next January of a monthly journal entitled the *American Engineering Magazine and Railroad Journal*, which will succeed the well-known *Van Nostrand's Engineering Magazine* and the little-known but old and formerly valuable *American Railroad Journal*. The new publication is to be a general engineering and mechanical journal, giving special attention to railroad engineering, and doubtless particularly to railroad rolling stock, concerning which Mr. Forney is an authority second to none.

The narrow-gauge mileage of the United States is still further diminished by the change of the St. Louis, Arkansas & Texas (until lately known as the Texas & St. Louis road), which has in all 735 miles of road, and was the longest continuous line of 3 ft. gauge in the country, although the Denver & Rio Grande has a greater mileage of road. The Missouri & Arkansas Division of this road was changed to standard gauge two weeks ago, and the Texas Division will be changed during the coming week.

The most prosperous narrow-gauge line in the country is the Boston, Revere Beach & Lynn, which in its last fiscal year earned over $25,000 per mile. The company paid 6 per cent. on its stock, and carried over a surplus equal to about 4½ per cent. more. This line is very peculiarly situated; it has practically no connections and no freight business, but it is so placed as to command an enormous passenger traffic, which could certainly have been carried quite as cheaply on 4 ft. 8½ in. or 6 ft. as on 3 ft. gauge. The road is only nine miles long, and its fares are low, the average receipt per passenger last year being about 11 cents only.

The electric brake which has been entered for the April, 1887, brake tests is the "Park," a brake heretofore unknown to fame, or very slightly known. The inventor is a Kentuckian by birth, who has recently removed to Chicago. The device has so far not been thoroughly tested, and the outcome must be regarded as doubtful, an unpleasant feature being an eccentric on the car axles, which, in view of the trouble from the slipping of locomotive eccentrics, must be regarded as a very dubious feature, especially for freight cars, although naturally the work thrown on the eccentric is much less than in the locomotive. It is plain that the ideal freight brake must have its parts at rest, except when required for braking purposes, although we doubt not that the committee will be anxious to give this brake every chance of entering the test fairly, especially should no other electric brake enter, as we hope and suspect will be the case.

The cotton movement so far this crop year has been lighter than usual. The receipts at the seaboard in bales, Sept. 1 to Oct. 29, have been, for eight years:

1881.	1882.	1883.	1884.	1885	1886.
1,424,046	1,423,666	1,465,907	1,435.830	1,388,453	1,343,801

Thus the receipts were smaller this year than in any other of the six; only 3 per cent. less than last year, but 6½ per cent. less than in 1885 and 8⅓ per cent. less than in 1883. The exports were about 2 per cent. greater this year than last (684,116 bales this year and 670,754 last), and the receipts at interior markets have been 9 per cent. greater.

The Northwestern grain receipts in the week to Oct. 23 were the smallest since the middle of July, and 1,471,000 bushels (18 per cent.) less than the week before. Accidents of weather, etc., probably caused part of the decrease, but some decrease at this time is to be expected. The receipts at the Atlantic ports were a fifth less than the week before and the smallest since July. The shipments from the Northwestern markets, on the other hand, were with two exceptions in the spring the largest of the year.

Our sporting editor, being quite closely confined to the sanctum, and seeing little of tracks, except the circular kind that have a judge's stand annexed, was quite surprised recently on taking a little outing to find that several first-class railroads were *not* unexceptionally perfect in all their appointments. He had not, indeed, seen any positive and particular statements that these roads had actually made certain changes and improvements which were long ago acknowledged to be necessary, but in his onesidedness and ignorance he had confidently assumed that they must, in ordinary course, have been attended to. Moreover, he had seen, in hotel billiard rooms and some other places, quite boastful assertions of the general passenger agents of these very roads which would naturally lead one to suppose that not much, if any, improvement could be made in their appliances and facilities until the percentage of expenses to gross earnings should drop down to *forty* at least. "Steel rails, rock ballast . . . and *all appliances* for safety," quite naturally induces the belief that one is perfectly safe, especially if he be riding rapidly in a car lined with real carved mahogany and supplied with fifty-cent soap and pink-plaid towels in the lavatory; and yet the clear plate-glass windows of these very cars frequently afforded a view of dangerous facing-point switches entirely unprotected by distant signals of any kind, and with not even a reasonable home signal (target). This road we now have in mind did not seem to have any extensive system of brooms to sweep away fog, or any unusual number of furnaces to dry it up, and yet every mile or two revealed quite expensive apparatus which would conduce materially to safe train running in clear weather, but would be worth just about nothing at all in foggy weather, when some of the worst collisions occur. We wonder whether the general sentiment among trainmen there is the same as it is on some roads, to wit, that "passenger trains must make their time, fog or no fog."

It is passing strange that a G. P. A. can boldly tell the public that his road is "the best in the world," and still ride frequently himself over its narrow bridges where there is no guard rail, or frog, or sign of any barrier between a derailed car and destruction. He ought to sit up nights with the road department and give them no peace till they mend their ways. Can it be poverty that causes these neglects, when the cost of protection on a whole road would not affect one dividend more than a quarter of one per cent? What is a superintendent thinking of who will provide very low, and very small, and perhaps very dirty switch targets in main track and still be so severe and critical with his runners who lose a few minutes occasionally that they dare not do otherwise than make their time, even at the risk of the passengers' lives, as well as their own. The horror at Rio seems to have been largely or wholly owing to the absence of a split-switch; and a momentary relief is felt when the thought comes that few good roads are still blind to the advantages of this simple means of safety; but, alas! it is not necessary to go to Wisconsin to find big and boastful roads which daily carry hundreds or thousands of passengers over old-fashioned stub rail switches without even a Tyler casting to mitigate the consequences of a switch-tender's carelessness. If the prominent roads set such a frightful example in management, what are we to expect from the lesser ones, which "do not lead, but follow?"

We suggest that the next Time Convention form a class and catechise its members on these and similar points, so that the vividness of the interrogative form may be brought to bear to impress a few of the serious points on the minds of the thoughtless. Nobody is warranted in spending a thousand dollars on the beautifying of a drawing-room car (or any other kind) until he has seriously questioned whether he has not (for instance) some dangerous facing-point cross-over track which that amount of money would change to trailing point several times over.

The joint committee of the Franklin Institute and of the Master Mechanics' Association to investigate the "Hammer Blow, or Magnitude and Variation of Pressure of Locomotive Driving Wheels on the Rails," has come to rather a lame and impotent conclusion. They report that "they have held meetings from time to time extending over a period of eight months," but the only definite conclusion they have reached as to the force of the "hammer blow" is that tests are desirable, and that they have devised a special apparatus by which such tests can be made which will cost $6,000, a sum which the committee very reasonably plead that they cannot be expected to furnish.

The committee do find it, however, to be "self-evident, upon careful observation, that, to balance any vibrating weight moving in a horizontal plane by counter-weights in the crank-wheel moving in a vertical plane of rotation, wherever the balance is made perfect in the horizontal direction, it is out of balance in the crank-wheel in a vertical direction equal to a large portion of the counter-weight employed to correct the horizontal movement," which is certainly an impregnable position. The committee continue:

"In view of this fact we find that engines considered most perfectly balanced by counter-weights in the crank-wheel do occasion great disturbance in a vertical direction (causing a wave force that may be compared to a hammer blow) that has a measure of destructiveness upon rails and bridges dependent on weight and velocity of moving parts, and that it is worthy of the most careful examination and test. The forces induced on both sides of the engine from this cause are of a complex character, varying greatly under modifying conditions that occur in practice, *and do not submit readily to calculation.*"

The clause which we have italicized is undoubtedly true in one sense—that experimental results would not probably correspond exactly with any computations—but that there is any such doubt in the matter as to leave room for any great surprises in the tests seems improbable. The whirling counter weights have a certain centrifugal force which can be determined exactly for any speed, and acts directly outward from the centre. The whirling coupling-rods, crank-pin and one end of the connecting-rod (approximately half of it) have likewise a centrifugal force acting directly opposite to and neutralizing, so far as it goes, the centrifugal force of the counter-weights. The difference between the two is entirely unbalanced, and acts to decrease the load per wheel when the counter-weight is upward and to increase it when the counter-weight is downward; in neither case affecting the riding of the engine, since it does not affect the springs, but having a material effect to vary the pressure on the rails, so that it is peculiarly adapted to increase vibration in bridges, and unquestionably does do so.

The reciprocating action of the piston and rod has nothing appreciable to do with this particular question, since it causes a (nearly) horizontal force which is taken up in strain against the crank-pin. In so far as this force does not act horizontally, it tends to decrease the upward force and increase the downward (the latter being the most objectionable) by modifying slightly the distribution of weight on the wheels.

But while an undulatory fluctuation of this nature undoubtedly takes place, it is sometimes exaggerated by considering the centrifugal force of the counter-weights only, without remembering that a large part of it is directly neutralized, and merely produces strain within the wheel, while the term "hammer blow" gives an untrue and exaggerated impression of its nature and effect.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Arizona.—Track laid from Tucson, Ari., north 15 miles.

Burlington, Cedar Rapids & Northern.—The *Sioux Falls Branch* is extended westward to Sioux Falls, Dak., 10¼ miles.

Carthage & Adirondack.—Completed from Carthage, N. Y., east to Jayville, 30 miles.

Chicago & Northwestern.—The *Lake City Branch* is extended from Lake City, Ia., west to Wall Lake, 13½ miles.

Chicago, Rock Island & Pacific.—Extended from St. Joseph, Mo., west to Troy, Kan., 15 miles.

Clearfield & Jefferson.—Extended west to Mebaffey, Pa., 3 miles.

Fort Worth & Denver City.—Extended from Harrold, Tex., northwest to Vernon, 16 miles.

Georgia, Midland & Gulf.—Extended northeast to Bull Creek, Ga., 6 miles.

Kentucky & Indiana Bridge.—Track laid on this bridge and approaches, from Louisville, Ky., to New Albany, Ind., 3 miles.

Litchfield, Carrollton & Western.—Track laid from Litchfield, Ill., westward to Calvinville, 16 miles.

Longdale Iron Co.—Track laid from Sewell, W. Va., to the Tyree coal mine, 8½ miles.

Missouri Pacific.—The *Kansas & Colorado Division* is extended west to Genesee, Kan., 4¼ miles.

Northern Pacific.—The *Cascade Division* is extended westward to Cle-elum, Wash. Ter., 18 miles.

Ohio Valley.—Extended from De Koven, Ky., south to Sturgis, 5 miles.

Parsons & Pacific.—Extended from Mound City, Kan., southwest to Coffeyville, 17 miles.

St. Louis & San Francisco.—The *Arkansas Division* is extended from Fort Smith, Ark., southward 20 miles.

St. Paul, Minneapolis & Manitoba.—The branch from Tintah west is extended from Hankinson, Dak., west to Rutland, 33½ miles.

San Antonio & Aransas Pass.—The main line is extended from Papalote, Tex., southward to Corpus Junction, 25 miles. The *Corpus Christi Branch* is completed by laying track from Corpus Junction south 8 miles.

Seneca Falls & Cayuga Lake.—Completed from Seneca Falls, N. Y., to Cayuga Lake Park, 4 miles.

Southern Pacific.—Track is laid on the southern end of the

Coast Line from Newhall Junction, Cal., northwest 8 miles.

Tavares, Apopka & Gulf.—Track laid from Tavares, Fla., south 10 miles.

Union Pacific.—The *Boulder & Caribou Branch* is extended from Marshall, Col., southeast to Argo Junction, 21 miles.

Williamsport & North Branch.—Extended from Sonestown, Pa., north to Nordmont, 6 miles.

This is a total of 316¼ miles on 23 lines, making 5,014 miles reported so far this year. The new track reported to the corresponding date for 15 years has been :

	Miles.		Miles.		Miles.
1886	5,014	1881	6,008	1876	1,931
1885	2,258	1880	4,946	1875	1,128
1884	3,193	1879	2,987	1874	1,594
1883	5,279	1878	1,777	1873	3,288
1882	8,731	1877	1,867	1872	6,106

This statement covers *main track only*, second or other additional tracks and sidings not being counted. The new track reported this year is now over 5,000 miles, and the record exceeds that of 10 out of the 15 years, having been exceeded only in 1883, 1882, 1881 and 1872.

NEW PUBLICATIONS.

Elements of Geodesy. By Prof. J. Howard Gore, B. S. New York. John Wiley & Sons.

This book of 275 pages opens with an exceedingly interesting historical sketch of the progress of science in the measurements of the figure of the earth. It is followed by a long and full chapters on instruments and methods of observation, base measurements and the field work of triangulation, which take up nearly half the book. The remainder of the work is occupied with the theory of the subject, the whole being put in such a way as to justify much more fully than usual the hope of the writer that the reader will "feel grateful that the discoveries and writings of many have been so condensed or elaborated as to make the study of geodesy pleasant."

Indicator Practice and Steam Engine Economy. By Frank F. Hemenway. John Wiley & Sons, New York.

This little work is largely confined to the study of other engines than locomotives, but a separate chapter is given to the latter, and so far as the taking and interpretation of indicator diagrams are concerned, the methods are much the same for all kinds of engines. The work is of an elementary character and can be readily followed by all those having practical familiarity with the steam engine, and for this reason and from the fact that it goes into practical details with a good deal of minuteness, it is calculated to be of much service to those who wish to make indicator tests without much familiarity with the theory of the subject. Some statements which, to say the least, are doubtful, are made in a rather over-positive way, but in the main there is little to object to in the volume, and much to commend.

Foreign Railroad Notes.

During the year ending March 31 last 376 miles of new railroad were opened for traffic in British India, making a total of 12,376 miles. The average cost per mile had been £9,595. The population is about 250,000,000, so that there is as yet only a mile of railroad to 20,000 people, against a mile to 460 in this country.

The management of the Austrian State Railroads has suspended the operation of the Dalmatian Railroad, one of its lines on the Adriatic, from Spalato to Sebenico, because of the danger of spreading the cholera.

The importance of the iron manufacture to the English railroads may be estimated by the fact that in that little country the product of pig-iron and the weight of coal and ore used in making it have been, in tons, for the last two years :

	Pig-iron.	Iron ore.	Coal.
1885	6,412,200	15,558,000	13,087,000
1884	6,824,000	16,577,000	13,907,000

In Scotland the quantities were about one-seventh as great, and altogether last year 17,938,000 tons of ore and 15,288,000 tons of coal were used to make 7,415,000 tons of pig-iron.

In Germany, as in this country, people who go to stations to see their friends off have been in the habit of getting into the cars with them and staying, not as here, till the train actually starts, but till the conductor comes round to call for tickets, which he does before the train starts. Not long ago, two gentlemen of position did this, accompanying a lady to a car and taking seats there for a time. They were complained of by the station-men, under a paragraph of the government railroad regulations which says that to enter a railroad car without a ticket is forbidden under penalty, and they were fined $1.50 each. They appealed and plead that they were ignorant of this regulation, but it was proved that it was posted up with the rest of them (they make a small volume) in two places in the station, and the gentlemen had to pay the fines.

Last February, in consequence of the breaking of a tire, the wheels of the third car from the rear of a passenger train running between Berlin and Breslau, on one of the Prussian state lines got off the track. The conductor on guard, who had a seat by the brake in this car, finding the bell cord fast with ice, passed along the foot-board at the side of the car to the next to the last car, which, like all the other cars except the one off the track, was provided with the Carpenter brake, and set the brake, stopping the train. The management of this railroad, with the approval of the Minister of Public Works, has given him 200 marks ($48), "in recognition of his courageous behavior and the devotion to duty manifested, by which he saved the passengers from injury and the railroad from loss," and called public attention to his act, which to one not familiar with the danger of sidling along the foot-board of a Prussian car as it bumps over the ties seems the most natural thing in the world.

TECHNICAL.

Hand Grenades on Trains.

The Harden hand grenade has lately done some good service in extinguishing fires on trains. In one case on the Columbus & Cincinnati Midland a freight car, containing glass jars in bulk packed in straw, caught fire whilst the train was in motion. The train was stopped, a hole cut in the top of the car and the fire extinguished without serious damage by the use of two of the grenades with which all the trains are equipped. A delay of only 20 minutes was occasioned to the train.

In another case on the Cincinnati, Hamilton & Dayton a car containing lime took fire. The fire was extinguished, and a considerable amount of property saved by the use of six hand grenades. The bottom of the car was burned through in two places.

Boiler Explosions in Great Britain.

The annual report of the British Board of Trade upon the working of the Boiler Explosions Act, 1882, states that during the twelve months ending June 30, 1886, preliminary inquiries under that act have been held in 57 cases. This is the largest number of explosions reported upon in either of the four years during which the act has been in operation, but the life lost per case fell below the average of the three previous years, the figures for the four years being :

Years.	Cases.	Lives lost.
1882-83	45	35
1883-84	41	18
1884-85	43	40
1885-86	57	33

In addition to the number of persons killed, there were 79 persons injured by explosions in 1885-86. Of the boilers which exploded, 16 were in use on board steamers and fishing smacks, and the remainder were used for various purposes on shore. The following is a general classification of the causes to which the explosions are attributable :

	Cases.
Deterioration, corrosion, safety-valve defective, etc.	32
Defective design or construction	16
Ignorance, neglect or carelessness of attendants	6
Miscellaneous	3
	57

No change has taken place in the general nature of the causes to which explosions may be traced, no less than 56 per cent. of the total number of cases being due to neglect on the part of the owners of boilers. Only six cases arose directly from ignorance or carelessness of the boiler attendants, although in a seventh case this was a contributory cause. In ten cases the boilers were under the inspection of insurance companies or guarantee associations, but in three of these the explosions were due to causes other than defects in the boilers or fittings, while in another case the owner ignored the repeated applications of the company for an opportunity to make a thorough examination of the boiler. Three explosions occurred on board vessels classed by Lloyd's, but only one of these was due to a defective design of boiler. Although a large proportion of the explosions were caused by the neglect or mismanagement of the owners—and not one of them can as a fact, be called an inevitable accident—no prosecution has been instituted under the criminal law. The verdicts of "accidental death" which were almost invariably returned, and generally without any qualification by coroners' juries in fatal cases, show that explosions are still regarded by the persons who sit on those juries as being due to causes which are beyond control, and unless evidence of the clearest and most conclusive kind can be produced, an attempt to secure a criminal conviction would be certain to end in failure.

Boilers are sometimes worked long after they are unsafe for any pressure, and with safety-valves which can be tampered with and overloaded, or even fixed down, and indeed in some cases without a safety-valve. An accurate pressure gauge regularly tested is rare. The boilers which have exploded were generally dangerously overworked, and the fittings were as a rule dangerously inefficient.

The number of boiler explosions in Germany is somewhat less than in Great Britain. Last year there were 13 boiler explosions in Germany, against 14 in 1884 and 1883, and 11 in 1882 and 1881. The number of casualties to persons was 22 (against 45 in 1884 and 55 in 1883), the number of fatalities being 11 (against 13 and 23), while 2 persons were badly injured and 9 slightly injured. Of the boilers which exploded 3 were vertical, 8 horizontal and 2 tubular, according to *Kuhlow*, a Berlin contemporary. The cause of explosion was in three cases local weakening of plates, in three cases want of water, in two cases defective construction, and in one case each accumulation of furs, high pressure, faulty action of tubes, weak and defective construction, and careless attendance. During recent years there has been a noticeable falling off in the number of explosions as in that of fatalities.

Engineers' Club of Philadelphia.

A regular meeting was held at the club house in Philadelphia, Oct. 16, Past President Frederic Graff in the chair; 23 members and 1 visitor present.

Mr. J. E. Codman presented an illustrated description of a case of Low Water in a Steel Boiler, wherein the refilling of the boiler, after the exposed portions had reached a high temperature, produced no evidence of a tendency to crack in the steel.

Mr. C. O. Hering presented Tables of Equivalents of Units of Energy and Equivalents of Units of Weights and Measures for the *Reference Book*.

Mr. J. H. Harden read a paper on Early Mining Operation in Berks and Chester Counties, Pennsylvania, giving the names of the charcoal furnaces, dates of construction, owners of the mines using the iron ore, location of the mines, management, cost and quantity of ore mined annually by the Berks & Chester Mining Co., beginning with 1836, under the management of Mr. Wm. McIlvain, continued by Mr. Hartley Potts, Mr. Robert S. Potts, Peter Ubil, Fred. Richards and John Kenny.

He referred to the operations of the Pennsylvania Copper Co., Captain Thomas, Manager, who died in 1808, and was succeeded by Mr. Richard Trewick as Manager and Treasurer; its failure and sale by the Sheriff in 1811.

Mr. Harden identified Mr. William McIlvain as the inventor and first user of the log washer for separating the fine ore from the dirt, and referred to its patent by Mr. John Milholland.

Mr. William E. Lockwood, introduced by the Secretary, gave a brief description and review of the progress made in the efforts to determine the "Hammer Blow" of a Locomotive's Drivers, since January, 1883, when Mr. Lockwood spoke on the subject of the Shaw locomotive before the Club.

Soda Locomotive Engines.

The Minneapolis, Lyndale & Minnetonka road has now in use on its city line in Minneapolis four soda locomotive engines of a pattern similar to those described in the *Railroad Gazette* of July 3, 1885, and in use on several German lines. These motors were built at the Baldwin Locomotive Works in Philadelphia.

Steel-tired Car Wheels.

The firm of W. R. Ellis & Co. having been dissolved, Nov. 1, by mutual consent, Messrs. Page, Newell & Co., No. 139 Milk street, Boston, have succeeded to the business carried on by the former firm in the sale of the wrought-iron spoke car wheel, manufactured by the Patent Shaft & Axle-tree Co., of Wednesbury, England, and known as the Brunswick wheel Messrs. Page, Newell & Co. state that the number of these wheels sold during the last year shows a very large increase over former years, and they claim that the service of the Brunswick wheel compares favorably with any other make, and to support this claim they will be pleased to furnish mileage records. Some of the advantages claimed for these wheels are that they can be re-tired in any railroad shop; that the wrought-iron centre is practically indestructible and will wear out several tires, and that the cost of re-tiring is several dollars less per wheel than any other pattern of steel-tired wheels. Messrs. Page, Newell & Co. have retained the services of Mr. George H. Coney, formerly with W. R. Ellis & Co., who will represent them as traveling agent.

Mr. W. R. Ellis, who, as noted above, resigned the American agency for the Patent Shaft & Axletree Co., of Wednesbury, England, proposes hereafter to supply steel-tired wheels with centre or tires of either American or foreign make, as may be desired by the purchasers. Mr. Ellis retains his former office at No. 18 Broadway, New York.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows :

Baltimore & Ohio, annual meeting, at the office in Baltimore, at 10 a. m., Nov. 15.

Mobile & Ohio, annual meeting of debenture-holders, the office of the company, No. 11 Pine street, New York, Nov. 20, at noon.

Peoria, Decatur & Evansville, special meeting, in Peoria, Ill., Dec. 20.

Richmond & Danville, annual meeting, at the office in Richmond, Va., Dec. 8, at noon. Transfer books close Nov. 8.

Richmond, Fredericksburg & Potomac, annual meeting, at the office in Richmond, Va., Nov. 17, at noon.

Richmond & West Point Terminal Co., special meeting, in Richmond, Va., Nov. 19.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows :

Boston & Maine, 5 per cent., semi-annual, payable Nov. 15, to stockholders of record on Oct. 28. This company paid 4 per cent. last November and 4½ in May.

New York, Providence & Boston, 2½ per cent., quarterly, payable Nov. 10. This company increases from 2 to 2½ per cent.

Pennsylvania, 2½ per cent., semi-annual, payable Nov. 29, to stockholders of record on Oct. 30. This company paid 2½ in May and 2 per cent. last November.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows :

The *Association of Railroad Trackmen of North America* will meet at Council Bluffs, Ia., on Thursday, Nov. 25.

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

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Foreclosure Sales.

The *Toledo, Peoria & Western* road was sold in Chicago, Oct. 29, under decrees of foreclosure granted by the United States Circuit Court, and was bought for $4,790,000, by Mr. John Bowers, of New York, representing the bondholders' committee. Another bidder was present, but declined to state whom he represented. The road extends from State Line, Ill., to Warsaw, 227 miles, with a branch of 20 miles to Burlington, Ia. It was originally the Toledo, Peoria & Warsaw road, was sold under foreclosure some years ago and reorganized under the present name. It was afterward sold to the Wabash, St. Louis & Pacific Co., but was last year reclaimed from the possession of that company by the bondholders, default having been made on the interest, and has for some time been under a separate receivership.

The *Havana, Rantoul & Eastern* road was sold under foreclosure in Springfield, Ill., Oct. 28, and bought for $100,000 for account of the bondholders, who have organized a new company to operate it. The road extends from Lebanon, Ind., to Leroy, Ill., 76 miles; it was recently a part of the Wabash system.

New England Railroad Club.

The Club will hold meetings at its rooms, Boston & Albany passenger station, Boston, Wednesday, Nov. 10, 1886, in the afternoon at 2 o'clock, and in the evening at 7:30.

It was thought desirable that two sessions be held to consider this important matter, and it is hoped that both sessions will be largely attended.

Subject for Discussion : *Interchange of Cars* (continued from last meeting). The discussion will have especial reference to the inspection of cars at interchange points, the defects in ladder rounds and handles, defective brake attachments, gauge of wheels, defective running boards, etc., and how far it is possible to remedy these *defects*.

Is it more rigid inspection, or more thoroughly constructed cars, or cars kept in more perfect condition, that is wanted to overcome existing difficulties in the interchange of cars? In view of the urgent necessity of immediate action in this matter, it is thought desirable to take this subject up and make a determined effort to arrive at some conclusions as to methods and plans for the adjustment of these perplexing questions. Superintendents of rolling stock, master car-builders, inspectors, and all others interested, are especially invited to be present, or if unable to do so to communicate their views in writing.

Brotherhood of Locomotive Engineers.

The sessions of the convention continued until Nov. 1, the only further diversions from business being a visit to the theatre and a short excursion to Rockaway Beach.

On Oct. 28 officers were chosen, Chief Arthur and nearly all the old officers being re-elected.

Western, the Indianapolis, Decatur & Springfield the Indianapolis & St. Louis, the Vandalia Line, nor the Ohio & Mississippi makes its stockholders happy. Some of them doubtless have excessive capital accounts, but the net earnings of the Ohio & Missis-ippi last year, when they were above the average of the last eight years, were only $1,743 per mile, or 6 per cent. on $29,059 per mile. The interest on its bonds, most of which pay 7 per cent., amounts to within $50,000 of last year's net earnings.

The showing made, indeed, is not very encouraging to the proprietors. Profits continue small in spite of a great increase in traffic and a considerable decrease in expenses.

Until May last its gross earnings were less than last year, but since they have been considerably larger, and in the first three months of the new fiscal year, July to September, there has been an increase of 16½ per cent., so that there is a prospect of improvement.

The Boston & Albany.

The Boston & Albany Railroad shows the effect of the h gher freight rates very decidedly in its report for its last fiscal year, ending Sept. 30 last. Notwithstanding a slight decrease in the freight traffic, it had an increase of no less than one-seventh in its freight earnings, this increase alone being equal to $2.66 per share of stock. There was al-o an increase of more than 7 per cent. in the passenger earnings, but this was due almost entirely to an increase in passenger traffic, which has grown very rapidly and uninterruptedly on this railroad since 1879—much more so than the freight traffic. The traffic has been for eight years, in *millions* of passenger and ton miles:

Million of	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Pass.-miles.	101 2	102.7	135.4	151 3	157 3	167 4	167.1	177 8
Ton-mi es ...	325 5	375.5	417.1	374.3	373 6	374 3	398 9	390 5

From 1879 to 1886 the increase in passenger traffic was 76 per cent., while the increase in freight traffic was but 20 per cent. But the average passenger rate has decreased largely and the freight rate not at all, which is very unlike the general course of rates. The passenger earnings last year were but 14 per cent less than the freight earnings; in 1879 they were 48 per cent. less. Thus the passenger business is becoming relatively more and more important. Last year it was 6 per cent. more than the year before, and much more than ever before; while last year's freight traffic was exceeded as long ago as 1881 as well as in 1885. In fact, the freight traffic since 1879 has been almost stationary, varying only from 374 to 417 millions and averaging 386 millions, which is but four millions less than last year's freight traffic. Last year's freight earnings were exceeded in 1880, 1881 and 1883, but not much, the rates having been maintained wonderfully well. The average rate received, in cents, per ton and per passenger per mile has been:

	1879.	1880	1881.	1882.	1883	1884.	1885	1886
Pass.-mile.....	2 14	2.08	1 97	1 99	2 09	1 91	1.84	1 85
Ton-mile.....	1.10	1 21	1.04	1.07	1.19	1.09	0 94	1.10

The average passenger rate has decreased, but the average freight rate for the eight years has been slightly less than the rate last year.

While the company's gross earnings increased $660,751 (8.7 per cent.) last year, with an increase of less than 2 per cent. in traffic, the increase in net earnings was but $144,039 (6 per cent.), there having been an increase of no less than 10 per cent. in the working expenses, which were larger than ever before, except in 1883. As the expenses were exceptionally small in 1885, being 8½ per cent. less than in 1884, in spite of an increase in traffic, we may suppose that the expenses were made unusually large last year because they were not large enough the year before. It is customary with this company, however, to pay for improvements and additions to the property out of earnings. The law of Massachusetts limits its dividends to 10 per cent., and it does not appear to be politic to pay more than 8, and sometimes the profits are a good deal more than this. The apparent surplus last year, however, was not quite 1 per cent. on the stock.

The gross earnings of this railroad were larger last year than in any other except 1883, and the net earnings were exceeded only in 1879, which was the year of *smallest* gross earnings. But it can hardly be said that the profits have shown any tendency to grow. Before last year for eight years the average net earnings had been $1,898,293 per year, and the years in which they exceeded that amount were 1879, 1880, 1883 and 1885. But the fluctuations in its net earnings have been very great, they being $2,350,330 in 1879 and $1,582,947 two years later, the decrease of $767,383 being equal to 3⅝ per cent. on the capital stock. Then in two years they increased 22½ per cent. This is probably in part due to the varying amount of earnings spent for construction but charged to expenses.

The Paris Railroad Exhibition.

As will be seen by his official circular, elsewhere published, Mr. John W. Weston, whose office is at No. 230 La Salle street, Chicago, has been appointed Commissioner General for the United States of the "International Railway Exposition and Congress," to be held in Paris from May to October, next year, as we have heretofore noted. All kinds of railroad apparatus and appliances are to be exhibited, and we could add immensely to the variety, interest and value of the exhibition by sending samples of our constructions and appliances. As few of these of our manufacture are used on European railroads, the motive which made the exhibition in Chicago, in 1883, so great and so excellent will be lacking: for the large expenditures required are not likely to be incurred by manufacturers unless there is hope of increasing sales thereby; but it ought to be possible by the co-operation of exhibitors, including railroad companies as well as manufacturers, to make an exhibition which will be fairly illustrative of American railroad practice, and be creditable to the nation. A modern American freight train, with one of our most powerful locomotives and power brakes, would probably be as interesting to European railroad men as anything in the exhibition; but we shall probably have to be content with sending sample cars instead of a whole train. Blank forms, etc., illustrating the clerical work connected with our freight transportation would be extremely interesting to a class of railroad men which is much more numerous there than here, and would certainly astonish them. An American railroad station of the one-man power class in full operation at the exhibition would also startle them and be as characteristic, perhaps, as anything we can show. If we send only what we can sell abroad, our exhibition will necessarily be very uneven and illustrate only a few details of our railroad practice. But if we do much more, it will probably be due to the patriotism and pride of the great manufacturers and the railroad companies themselves; and the latter are not likely to do anything worthy of the country unless they co-operate. If they did this under a competent head, they might provide a very fine exhibition without great cost to any one of them, and have it shown by competent attendants—a matter of prime importance. But it is so difficult to get the companies to co operate in matters seriously involving their direct pecuniary interests, that we have little hope that they will do so in this. They certainly will not unless some one takes the initiative in a very vigorous way.

It will be easier to select delegates who will represent the country adequately in the Railroad Congress. As many as possible of these should be able to speak French, and papers to be submitted at the Congress should be translated into French.

This is the great railroad country. Our mileage is greater than that of all Europe, and we have adapted railroads to almost all imaginable conditions; and a railroad exhibition with the United States unrepresented or very imperfectly represented, if not like the play of Hamlet with Hamlet left out at least will lack very much of being a universal exhibition, such as this is intended to be.

The Master Car-Builders' New Standards.

As will be seen from an illustrated article in another column, four new standards have been added to the now long list adopted by the Master Car-Builders' Association: a standard dead-block casting a standard for double dead-blocks, a standard wheel-tread and a standard brake-shoe. One standard was emphatically rejected, the proposed standard height for passenger car draw-bars of 34½ in.

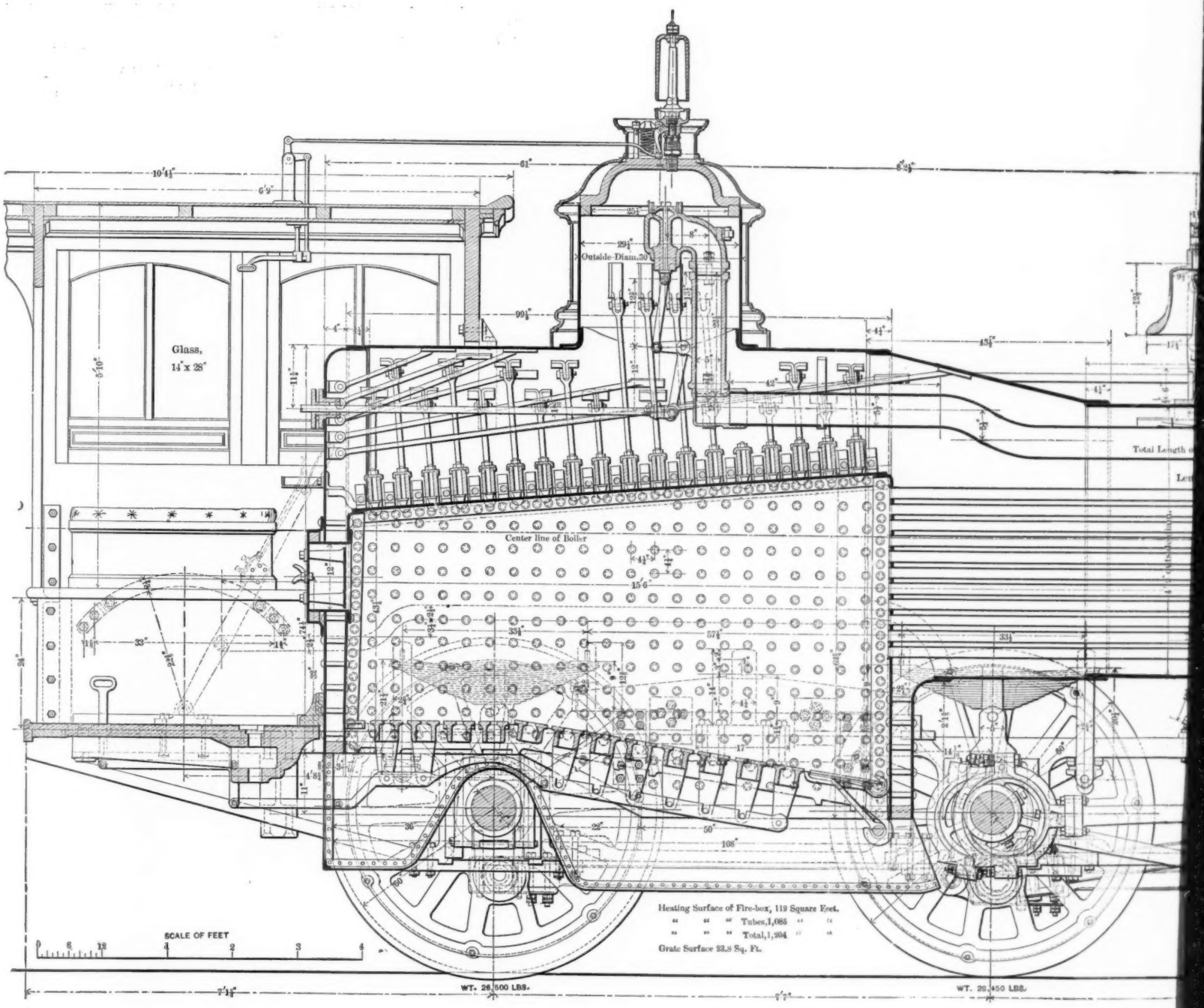
The actuating motive for the latter was probably, in good part, that it was regarded as an entering wedge for a change of freight car standard to the same figure, which was so emphatically "sat down upon" in the last convention that it was not even allowed to go to letter-ballot. The feeling of the convention evidently was that the Association would be stultifying itself by the proposed action, punishing those who had done their duty by making one change at their request in the interests of uniformity by compelling them to make another, in order to reward those who had shown no readiness to make even one change in the interest of uniformity. The attempt to show that there was any valid mechanical objection to the height which has so long been standard was evidently looked on as rather "thin." The question of a passenger standard is a somewhat different one, to this extent at least, that the existing standard is far less generally used in passenger than in freight stock, but the action had clearly indicates that the Association as a body does not mean to countenance any change whatever in this standard, for the present at least, nor does it now appear likely that it ever will.

The modified wheel-tread section which has been adopted follows exactly the suggestion of the *Railroad Gazette* that the cylindrical part of the tread formerly proposed should be given a slight cone, without further change. By it the former vote of 233 ayes to 145 noes (not two-thirds) has been increased to the more nearly unanimous vote of 411 to 91. There can be no doubt that the changed tread is at least a more prudent one to adopt, if not a better one. No one could tell exactly what would be the effect of entirely cylindrical treads, and there was at least a chance that the motion of the wheels would be unfavorably affected, while it was certain that their motion over frogs would be worse than with the revised form. There is grave reason to question whether it was wise to adopt the small fillet radius of ⅝ in. in place of the ¾ in. radius, which has heretofore been more usual, but the difference is not great, and probably no serious harm will result.

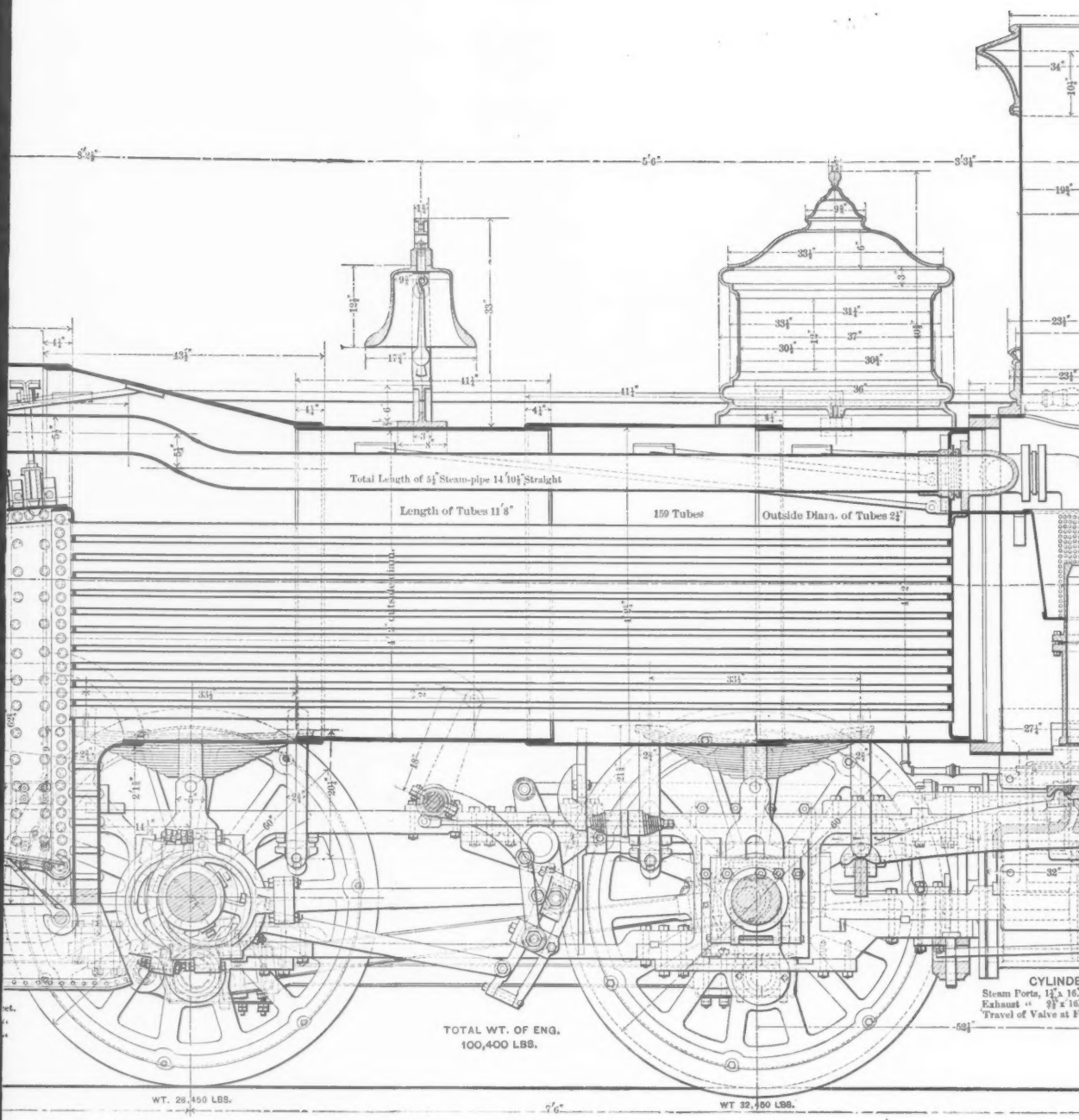
The two new dead-block standards are unquestionably desirable additions to the list. There is no possible reason why any difference of practice in respect to these details should be desired or adhered to, unless temporarily for special reasons. In respect to the new standard brake-shoe, the case is not so clear. If there were any reasonable hope that all the dozen or twenty brake-shoes in use would be abandoned in favor of the Christie, it would be much clearer. As we take it to be undoubted that there is no immediate prospect of any such happy result, however, the question naturally arises: Is it better to have one "standard" and a dozen other similar devices in use which are not standard, or, by giving every one a choice between two or three standards, practically to insure that one or the other of them, or all three together, shall be in practically universal use? We fear that not enough attention has been paid to the lesson which may be learned from the fate of these standards after they have been adopted, which certainly tends to indicate that in the effort which is still vigorously continued to have every detail of car construction reduced to one single universal type for the whole country, the Association is acting unwisely, in that it is attempting the impossible. Supposing some action like this were taken: that any truck or detail or part thereof, or any part of car-bodies, other than couplers and appliances involving the safety of trainmen, which was shown to be in use or about to be put in use on not less than 50,000 to 100,000 cars, should on proper application be declared a standard of the Association? Would not that be doing really more to bring about the desired end of practical uniformity than to continue to labor indefinitely to bring about a nominal agreement on single standards which it is a patent fact that a great many persistently continue to disregard? The question thus raised is a large one, which we cannot go into further just now, but it is one which, in view of the past history of the nominal standards, is well worth consideration. Of course, on such a question as the height of draw-bars no compromise is possible. It must be one standard or none; but there are many details, like brake shoes, journal boxes and axles, in which, if we can reduce confusion worse confounded to two or three standards to be kept on hand for repairs, we have accomplished the desired end almost as fully as if we had one standard only, and we have accomplished it far more completely if in the one case we have taken action which will ACCOMPLISH its end, and in the other not, as so far it certainly has not.

The pressure on our columns of matter that cannot well be postponed is too great to permit of our publishing this week the somewhat voluminous final records of the results of the Burlington brake tests, which really contain the pith of the whole matter, and should be given together. As we cannot give it all, it seems better to give none.

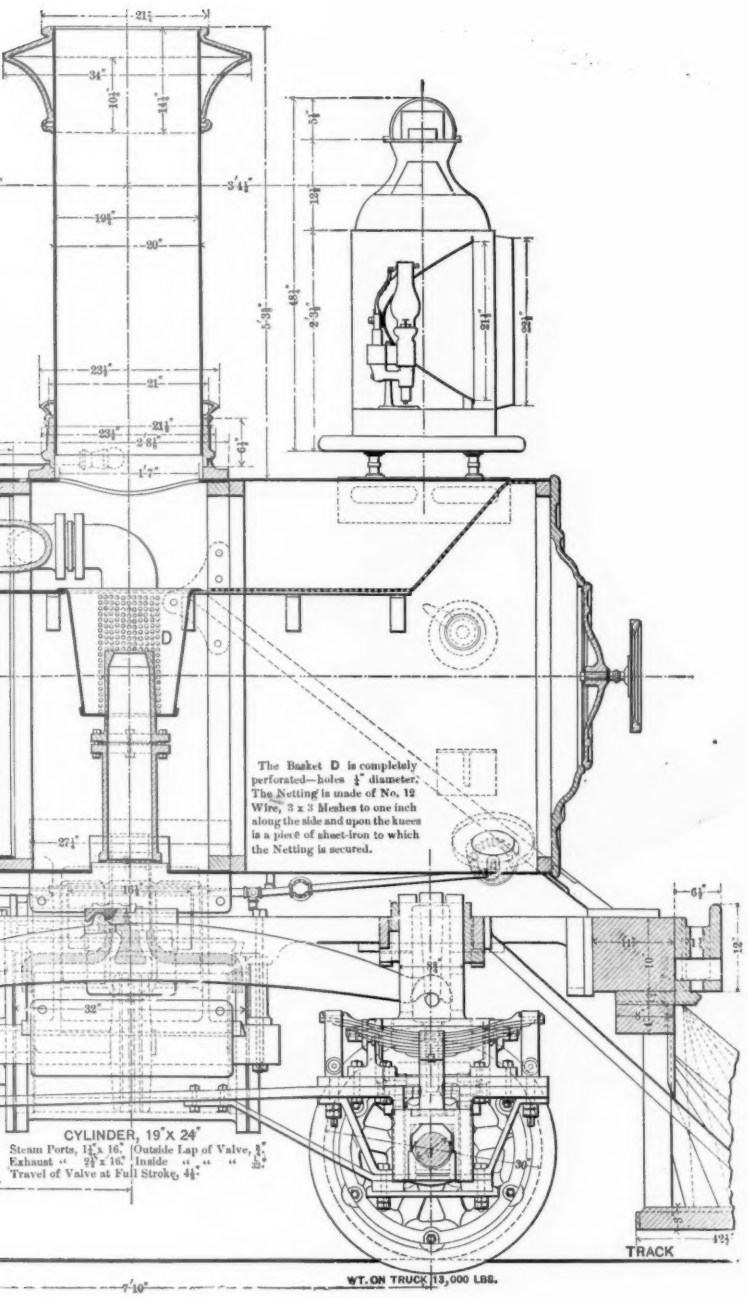
We print in another column a very seasonable suggestion from one of our best-known wheel makers. Common sense would indicate that in changing from chilled wheels to steel tires, as far as possible the same standard sizes should be adhered to. But as the steel tire can well stand a wear giving a difference of some three inches in diameter, it is obvious that the standard sizes of steel-tired wheels should have regard to their mean or average diameter when half worn out. Thus a steel-tired wheel measuring when new 33 in. on tread will really during its life have an average diameter of 31½ in.; and when worn out will only measure 30 in. diameter. It would, therefore, be better, as suggested by Mr. Snow, to adopt such a scale of standard sizes for steel-tired car wheels that during the life of the tire it will never differ by more than 1½ in. from the usual standard sizes of chilled wheels.



MOGUL FREIGHT LOCOMOTIVE, BALTI



MOGUL FREIGHT LOCOMOTIVE, BALTIMORE & OHIO RAILROAD


The Basket D is completely perforated—holes ¼" diameter. The Netting is made of No. 12 Wire, 3 x 3 Meshes to one inch along the side and upon the knees is a piece of sheet-iron to which the Netting is secured.
CYLINDER, 19"X 24"
Steam Ports, 11½" x 16" Outside Lap of Valve, ¾"
Exhaust " 2¼" x 16" Inside " " " 3/32"
Travel of Valve at Full Stroke, 4½"
TRACK
WT. ON TRUCK 13,000 LBS.

The enormous difficulty of securing unity of action among a large number of railroad companies even with regard to some matter in which their interests are almost identical—as in the matter of uniform time standards, for instance—has often been remarked. In the associations for maintaining uniform through rates, this is especially manifest; for though it is for the interest of all that rates should be maintained, it is for the interest of each that its share should be as large as possible, and out of a large number of companies there is likely to be one or more whose management believes that it can make more outside of the association than it can in it, as it usually could if in spite of its abstention the other lines would combine and maintain their rates. To induce a number of competing companies to co-operate is at best a difficult task, and its difficulty increases with the number of managements and of interests to be harmonized—with the square of the number, we are inclined to say.

The work of the Central Traffic Association, which Mr. Geo. R. Blanchard has undertaken to direct as Commissioner, is thus in its nature extraordinarily difficult. There are forty railroads in it, and these are complicated with connecting railroads in such a way that they cannot easily control the rates at their Western termini. There are said to be no less than 570 junction points in the territory of the Association, and they are increasing every year. The connecting points with lines west of the field in which the Association endeavors to control rates have multiplied to such an extent that well-maintained pools at the great traffic centres like Chicago, St. Louis and Peoria will not prevent a very large part of the traffic interchanged with roads further west from slipping through by one of these junction points at a cut rate. All these things must be provided for if the Association is to be successful, and probably in time and with the co-operation of the Eastern trunk lines they can all be provided for; but we must not be surprised if the results are at times unsatisfactory, especially if, as now, the Eastern trunk lines themselves fail to give a firm foundation on which their Western connections may build.

This is brought to mind by the very interesting address of Mr. Blanchard to the managers of the Central Traffic Association, Oct. 20 last, which gives much valuable information concerning the past working of the Association and its present difficulties, and makes some important recommendations, some of which we have noticed heretofore. Other parts of the address we hope to consider hereafter.

The application of the trustees of the Houston & Texas Central first mortgage for an order of the Court to sell 283,200 acres of the state land grant which form part of the security for these bonds *before Nov. 20 next* is only one more and perhaps the most striking instance of the manner in which the interests of this company's bondholders have been neglected by those responsible for its management. The reason given by the trustees for this application is that the authorities of the state of Texas claim that by the terms of the land grant one-half of the lands were to be sold by the company within 14 years from the date of their acquisition, and that that time will expire Nov. 20. If this is a condition of the land grant, what is to be said of the management of the company, which held on to so large a part of the lands until within a few years of the date; still more, what is to be said of the conduct of the receivers, and, most of all, what is to be said of the conduct of the trustees of the first mortgage, in whose special custody lies the protection of the interests of the bondholders, and who waited until only *four weeks* remained before the date of forfeiture of the lands before taking any steps in the matter? There probably is not one bondholder who ever heard of such a condition in the land grant, which, unless the trustees were grossly negligent, must always have been familiar to them. In the time remaining before Nov. 20, it would simply be impossible to sell so large a body of lands for anything like what they are worth, or probably to sell them at all, except to some person or organization which has made preparation for just such an emergency for the purpose of depriving the first-mortgage bondholders of part of their security.

The trustees say in their petition to the Court, that they are advised that the claims of the Texas authorities are unfounded and cannot be maintained, but that as the Governor and Attorney-General of Texas declare that they shall insist on those claims and take proceedings to enforce them, it will tend to throw a cloud on the title of the lands unless they are sold before Nov. 20. That would have been a reasonable petition to make two or three years ago.

If such a sale is necessary, it should by all means be made subject to the lien of the first-mortgage bondholders. The land then probably would bring very little, but the bondholders would have their security; and as there is already $861,560 of interest overdue to them, they are entitled probably to the whole value of the land now, to say nothing of the security for future interest and the principal.

An inquirer in Chicago writes to ask us "If 3 in. elevation in a track on a 3-degree curve is sufficient for a speed of 60 miles per hour, is 1 in. elevation enough for a 1-degree curve at the same rate of speed? If not, why?"

We answer that we do not know, and we know of no one who does. The centrifugal force is directly as the degree of curvature, and if the only object of super-elevation be to balance and counteract this centrifugal force, as is usually taken for granted, then our correspondent's question must be answered yes. There is, however, another force, compared with which the centrifugal force of the fastest train is a bagatelle, which tends to crowd, and does crowd the outside flange of the slowest train against the outer rail, however much elevated, which has to be considered; viz., the tendency of the truck to run in a straight line and not in a curve. This force is independent of the degree of curvature, or very nearly so, since the truck must be continuously twisted, however easy the curve, and whether it be twisted fast or twisted slowly demands the same flange pressure in pounds, although a very different amount of WORK in foot-pounds. The elevation necessary to counteract this force would be far beyond the limits of possible practice, viz., from 1 ft. to 15 in. on *all* curves, sharp and easy. Inasmuch as whatever elevation there is tends to reduce this force, however, and diminish the flange pressure, there is plausible ground for the claim (which, be it understood, we do not advance as a fact, but merely as a suggestion) that the better practice would be to elevate all curves as much as would balance the centrifugal force of the fastest trains, and never less than 2 or 3 in. This would unquestionably improve the riding of fast trains, and we imagine that, in so far as it had any effect, it would diminish the resistance of slow freight trains. There is room for some good experimental work in this direction, which has never yet been done.

A few railroads have reported their October earnings thus early, showing:

	1882.	1883.	1884.	1885.	1886.
M., L. S. & W.	$86 708	$112,524	$103 837	$158 025	$251 552
C., M. & St P.	2,250,975	2 531 128	2,539,796	2,892,473	2,799,000
C & N W.	2,60 ,445	2,793,991	2,523,843	2,878,109	2,884,800
Den & R G.	642,213	720,445	567,285	626,364	7 3 212
North Pac.	824,769	1,397 222	1,461 5 1	1,522, 85	1,487,144
St. L. & S. F.	369,06	370,160	512,758	486,386	5 5,317

The Milwaukee, Lake Shore & Western continues the enormous gain it has had in previous months of this year since lake navigation opened and shipments of ore began. The Milwaukee & St. Paul earned 3¼ per cent. less than last year, but much more than ever before. The Chicago & Northwestern has a trifling gain over last year, a large one (14 per cent.) over 1884, but only a small one over 1883. The gains of the last two companies over last year in successive months have been:

	June	July.	Aug.	Sept	Oct.
C., M & St. P	$198,813	$142,024	$ 06 089	$281,722	D. $93,478
Chi. & N. W.	120,769	109,630	406,231	134,976	61,631

Thus the gain over last year was much less in October than in any of the other months, yet it cannot be said that October was this year a less favorable month than previous months, but rather that it was much more favorable than the previous months last year. Thus the *increase in October over September* has been:

	1882.	1883.	1884	1885.	1886
C., M. & St. P.	$300,265	$310,444	$338,555	$619,196	$244,000
C. & N. W.	48 404	146,023	176,9 9	326,145	197,500

The increase from September to October was thus nearly twice as great last year as ever before, and this year, in spite of the fact that September earnings were unusually large, it was for the two roads together very nearly as large as in any year except last year.

The Northern Pacific, which has been having large gains, had a small decrease (2¼ per cent.) in October, leaving the earnings larger than in any earlier year. This is the natural result of the unusually early marketing of the spring wheat, which made the earnings in August and September very much larger than ever before. The earnings of the three months ending with October have been:

1883.	1884.	1885.	1886.
$3,635,560	$3,730 673	$3,718,529	$4,174,902

Thus the earnings since harvest have been nearly 12 per cent. greater than ever before, and this season must be regarded as very favorable, even if there should be a decrease in November as well as October, which is not improbable, as the earnings were exceptionally large in November last year, and the movement of wheat to Duluth in that month was altogether unprecedented.

The St. Louis & San Francisco earned more this year than ever before, but the gain over last year was only $33,929 in October, against $ 3,713 in September, $87,340 in August and $ 1,073 in July, and an average monthly gain of $21,017 in the first half of the year.

The Denver & Rio Grande has the large gain of 12¼ per cent. over last year, and earned more than in any other year except 1883, when the earnings of the 362 miles of the Denver & Rio Grande Western were included.

Pennsylvania Railroad Earnings in September.

Notwithstanding good gain in the gross earnings of the lines of this company east of Pittsburgh and Erie in September, the net earnings were less than last year, which will doubtless be disappointing to many, but as last year the net earnings in September were among the largest the company has ever had—exceeded only in October of the same year, in August and October of 1884, in three months of 1883, two of 1882 and two of 1876 (centennial travel), this year's net earnings must still be considered large.

For 14 successive years the gross and net earnings and expenses of lines east of the Pittsburgh and Erie in the month of September have been:

Pennsylvania Railroad Earnings and Expenses in September.

Year.	Gross earnings.	Expenses.	Net earnings.
1873	$4,039, 96	$,195,096	$1,844,100
1874	5,252,228	2, 39,810	1,2 2,418
1875	3,571, 57	1,807 504	1,673,5 3
1876	3,869,994	1,6 9 320	2,220,674
1877	3,00 ,408	1,471,691	1,5 4 717
1878	2,858,646	1,456,451	1,402,195
1879	3,336,529	1,745,891	1,590,638
1880	3 647,543	2,172,634	1 474,909
1881	3,735 0 6	2,271,829	1,463,177
1882	4 4 7,602	2 683, 76	1,734 426
1883	4,634 999	2,712,635	1,922 364
1884	4,4 8 871	2, 71,5 7	1,887 314
1885	4 276 628	2,384,658	1,891,970
1886	4,674 052	2,857,598	1,816,454

Thus the gross earnings of the month were larger this year than ever before, though but $39,000 more than in 1883. The working expenses were much larger this year than ever before, and larger than in any other month of any year except June of this year, June of 1883, and December of 1882. This leaves the net earnings smaller this year than in any other since 1882.

Compared with last year there is:

In gross earnings an increase of.......$397 424, or 9.3 per cent.
In expenses an increase of.......... 472,940, or 15.6 " "
In net earnings a decrease of.......... 75,516, or 4 0 " "

The very large increase in expenses is partly because the expenses were unusually large this year, but also because they were unusually small last year. As we see, they were then $328,000 less than in 1883; and this year they were $44,000 *more* than the average of the three summer months, while last year they were $168,000 *less* than the average of those months. The through rates last year were at their lowest, but the improvement in them probably made the smaller part of the gain in gross earnings, for the activity in the great manufacturing industries on this road, particularly in the iron industries, must have very greatly increased its local traffic.

The lines west of Pittsburgh and Erie have yielded the following surplus or deficit over or below all liabilities in September:

1879—Surplus	$345,688	1883—Surplus	$321,789
1880— "	222,018	1884— "	50,632
1881— "	214,1 3	1885—Deficit	9 2 6
1882— "	445,870	1886—Surplus	82,423

The Western system has always yielded a surplus in September except last year; it gains $172,649 over last year, but the surplus was much less than in any of the five years previous to 1884. It indicates that the capacity of this western system to yield profits has been permanently reduced (by the multiplication of railroads probably), when in spite of an unusually large crop movement at the time and much activity in manufacturing industries, this great system in August and September should yield a surplus over liabilities of only $152,094, while in the four years previous to 1884 it had yielded from $439,000 to $712,000. The fall months are the most profitable ones for this system, which usually has a larger surplus in October than in September, but the crop movement was unusually early this year, and in spite of that the profits were so small in August and September that any probable gains later in the year will make the surplus of the whole system but trifling for the whole year, and much less than we should have expected from the advance in through rates, and the activity in iron manufactures. This system has an immense traffic in the materials of the iron industry, and in its manufactures, carrying ores from Cleveland to Pittsburgh, and other points where there are blast furnaces, and carrying coke back and to the West. It has not now, however, nearly so large a share of the coke traffic as when the iron manufactures revived in 1879, and probably a smaller one of the other iron traffic, and probably rates are much lower now, for though about as much iron is made now as ever before, the prices of pig are very much lower than in 1879, 1880, etc.

For the nine months ending with September the gross and net earnings and working expenses of the lines east of Pittsburgh and Erie for ten successive years have been:

Pennsylvania Railroad Earnings and Expenses for Nine Months

Year.	Gross earnings.	Expenses.	Net earnings.
1877	$22,006,256	$14,088 741	$7,9 7,515
1878	22 819 9 8	13,534,111	9 285,807
1879	24 516,214	14 8 3,106	9 693, 08
1880	30 2 3,6 7	17 8 7,3 2	12,426,305
1881	32,878,246	19 482 436	13 395,810
1882	35 887,786	22,283, 80	13 6 4 506
1883	37 892 916	23,816,364	14,076,552
1884	36,398,108	22 855,843	13 542,265
1885	33 236,640	22,015 664	11,220, 76
1886	36,865,292	23,894,455	12,971 837

The gross earnings this year were exceeded only in 1883;

the working expenses were larger than ever before, but the net earnings were exceeded in each of the four years from 1881 to 1884, by amounts varying from $424,000 to $1,105,000. Compared with last year the increases are:

In gross earnings	$3,628,652,	or 10.9 per cent.
In working expenses	1,877,791,	or 8.5 "
In net earnings	1,750,861,	or 15.6 "

The gain in net earnings on this sytem is equal to 1.87 per cent. on the stock outstanding.

Meanwhile the surplus or deficit of the lines *west* of Pittsburgh and Erie has been:

1879—Surplus	$168,834	1883—Surplus	$894,318
1880— "	2 095,565	1884— Deficit	661,859
1881— "	2,268,783	1885— "	1,744,485
1882— "	1,067,772	1886— "	261.783

Thus, this Western system still shows a deficit for the year which may reasonably be expected to disappear by the end of the year. It is encouraging that it should be so much less than last year or the year before, but discouraging that the result should be so much less favorable than in any of the five years previous to 1884. In 1881 this system yielded in the nine months $2,530,000 more than this year—of itself equal to 2⅔ per cent. on the stock now outstanding, and to 3¼ per cent. on the stock then outstanding.

Combining the surplus or deficit of the Western system with the net earnings of the Eastern system for the nine months we have as the income from both systems:

1879	$9,801,942	1883	$14,970,870
1880	14,522,870	1884	12,880,406
1881	15,064,593	1885	9 976 491
1882	14 672,278	1886	12,710,054

Thus the gain over last year is no less than $2,734,563, which is 2⅞ per cent. on the capital stock, but its income is a little less than in 1884, and from $1,812,000 to $2,954,000 less than in any of the four years from 1880 to 1883. Of the gain over last year, nearly two-thirds was made by the lines east of Pittsburgh and Erie, which last year had not quite one-half of the gross earnings of both systems.

Last year September was the last month when the gross earnings of the Eastern system were much less than the year before, August being the last month when the net earnings were much less. The gross and net earnings of the Eastern system and the surplus or deficit of the Western system for the *last three* months of the year have been:

	Eastern system. Gross earn.	Eastern system. Net earn.	Western system.	Income from both.
1880	$11,005,457	$4,208,722	Surplus.. $975 487	$5,184,209
1881	11.245,007	4.018.627	" .. 379,555	4,397,982
1882	13,191,117	4 824,986	" .. 826,528	5.651,514
1883	13,189 334	5.256,552	Deficit... 71,649	5.184,903
1884	12,167,809	4,494,640	" ... 200,032	4,294,608
1885	12,377,392	4.911.297	Surplus.. 162,471	5,073,768

Thus in the last quarter of the year the gain in the profits of the systems was very large last year, and they were nearly as large as in any previous year except 1882. For this reason, it is not to be expected that the gains this year in these remaining months will be at as great a rate as in the months heretofore reported, and the result will be quite good should there be no gain at all. Business was unusually active in these months, but some of the conditions are more favorable this year, and moderate gains seem probable. But most of the gain of this calendar year over last year has doubtless been made already—was made before September,—for the gain in the profits of the two systems was less than $7,000 in that month, while for the other eight months it had averaged $341,000 per month. It is doubtful if the gain will be as much as that for the entire three months that remain to be reported, and a reasonable figure for the gain of the whole year is $3,000,000, which ought to be satisfactory to the shareholders.

Mr. M. N. Forney, who needs no introduction to the readers of the *Railroad Gazette*, will begin the publication next January of a monthly journal entitled the *American Engineering Magazine and Railroad Journal*, which will succeed the well-known *Van Nostrand's Engineering Magazine* and the little-known but old and formerly valuable *American Railroad Journal*. The new publication is to be a general engineering and mechanical journal, giving special attention to railroad engineering, and doubtless particularly to railroad rolling stock, concerning which Mr. Forney is an authority second to none.

The narrow-gauge mileage of the United States is still further diminished by the change of the St. Louis, Arkansas & Texas (until lately known as the Texas & St. Louis road), which has in all 735 miles of road, and was the longest continuous line of 3 ft. gauge in the country, although the Denver & Rio Grande has a greater mileage of road. The Missouri & Arkansas Division of this road was changed to standard gauge two weeks ago, and the Texas Division will be changed during the coming week.

The most prosperous narrow-gauge line in the country is the Boston, Revere Beach & Lynn, which in its last fiscal year earned over $25,000 per mile. The company paid 6 per cent. on its stock, and carried over a surplus equal to about 4½ per cent. more. This line is very peculiarly situated; it has practically no connections and no freight business, but it is so placed as to command an enormous passenger traffic, which could certainly have been carried quite as cheaply on 4 ft. 8½ in. or 6 ft. as on 3 ft. gauge. The road is only nine miles long, and its fares are low, the average receipt per passenger last year being about 11 cents only.

The electric brake which has been entered for the April, 1887, brake tests is the "Park," a brake heretofore unknown to fame, or very slightly known. The inventor is a Kentuckian by birth, who has recently removed to Chicago. The device has so far not been thoroughly tested, and the outcome must be regarded as doubtful, an unpleasant feature being an eccentric on the car axles, which, in view of the trouble from the slipping of locomotive eccentrics, must be regarded as a very dubious feature, especially for freight cars, although naturally the work thrown on the eccentric is much less than in the locomotive. It is plain that the ideal freight brake must have its parts at rest, except when required for braking purposes, although we doubt not that the committee will be anxious to give this brake every chance of entering the test fairly, especially should no other electric brake enter, as we hope and suspect will be the case.

The cotton movement so far this crop year has been lighter than usual. The receipts at the seaboard in bales, Sept. 1 to Oct. 29, have been, for eight years:

1881.	1882.	1883.	1884.	1885	1886.
1,424,046	1,423,666	1,465,907	1,435.830	1,388,453	1,543,801

Thus the receipts were smaller this year than in any other of the six; only 3 per cent. less than last year, but 6½ per cent. less than in 1885 and 8⅓ per cent. less than in 1883. The exports were about 2 per cent. greater this year than last (684,116 bales this year and 670,754 last), and the receipts at interior markets have been 9 per cent. greater.

The Northwestern grain receipts in the week to Oct. 23 were the smallest since the middle of July, and 1,471,000 bushels (18 per cent.) less than the week before. Accidents of weather, etc., probably caused part of the decrease, but some decrease at this time is to be expected. The receipts at the Atlantic ports were a fifth less than the week before and the smallest since July. The shipments from the Northwestern markets, on the other hand, were with two exceptions in the spring the largest of the year.

Our sporting editor, being quite closely confined to the sanctum, and seeing little of tracks, except the circular kind that have a judge's stand annexed, was quite surprised recently on taking a little outing to find that several first-class railroads were *not* unexceptionally perfect in all their appointments. He had not, indeed, seen any positive and particular statements that these roads had actually made certain changes and improvements which were long ago acknowledged to be necessary, but in his onesidedness and ignorance he had confidently assumed that they must, in ordinary course, have been attended to. Moreover, he had seen, in hotel billiard rooms and some other places, quite boastful assertions of the general passenger agents of these very roads which would naturally lead one to suppose that not much, if any, improvement could be made in their appliances and facilities until the percentage of expenses to gross earnings should drop down to *forty* at least. "Steel rails, rock ballast . . . and *all appliances* for safety," quite naturally induces the belief that one is perfectly safe, especially if he be riding rapidly in a car lined with real carved mahogany and supplied with fifty-cent soap and pink-plaid towels in the lavatory; and yet the clear plate-glass windows of these very cars frequently afforded a view of dangerous facing-point switches entirely unprotected by distant signals of any kind, and with not even a reasonable home signal (target). This road we now have in mind did not seem to have any extensive system of brooms to sweep away fog, or any unusual number of furnaces to dry it up, and yet every mile or two revealed quite expensive apparatus which would conduce materially to safe train running in clear weather, but would be worth just about nothing at all in foggy weather, when some of the worst collisions occur. We wonder whether the general sentiment among trainmen there is the same as it is on some roads, to wit, that "passenger trains must make their time, fog or no fog."

It is passing strange that a G. P. A. can boldly tell the public that his road is "the best in the world," and still ride frequently himself over its narrow bridges where there is no guard rail, or frog, or sign of any barrier between a derailed car and destruction. He ought to sit up nights with the road department and give them no peace till they mend their ways. Can it be poverty that causes these neglects, when the cost of protection on a whole road would not affect one dividend more than a quarter of one per cent? What is a superintendent thinking of who will provide very low, and very small, and perhaps very dirty switch targets in main track and still be so severe and critical with his runners who lose a few minutes occasionally that they dare not do otherwise than make their time, even at the risk of the passengers' lives, as well as their own. The horror at Rio seems to have been largely or wholly owing to the absence of a split-switch; and a momentary relief is felt when the thought comes that few good roads are still blind to the advantages of this simple means of safety; but, alas! it is not necessary to go to Wisconsin to find big and boastful roads which daily carry hundreds or thousands of passengers over old-fashioned stub rail switches without even a Tyler casting to mitigate the consequences of a switch-tender's carelessness. If the prominent roads set such a frightful example in management, what are we to expect from the lesser ones, which "do not lead, but follow?"

We suggest that the next Time Convention form a class and catechise its members on these and similar points, so that the vividness of the interrogative form may be brought to bear to impress a few of the serious points on the minds of the thoughtless. Nobody is warranted in spending a thousand dollars on the beautifying of a drawing-room car (or any other kind) until he has seriously questioned whether he has not (for instance) some dangerous facing-point cross-over track which that amount of money would change to trailing point several times over.

The joint committee of the Franklin Institute and of the Master Mechanics' Association to investigate the "Hammer Blow, or Magnitude and Variation of Pressure of Locomotive Driving Wheels on the Rails," has come to rather a lame and impotent conclusion. They report that "they have held meetings from time to time extending over a period of eight months," but the only definite conclusion they have reached as to the force of the "hammer blow" is that tests are desirable, and that they have devised a special apparatus by which such tests can be made which will cost $6,000, a sum which the committee very reasonably plead that they cannot be expected to furnish.

The committee do find it, however, to be "self-evident, upon careful observation, that, to balance any vibrating weight moving in a horizontal plane by counter-weights in the crank-wheel moving in a vertical plane of rotation, wherever the balance is made perfect in the horizontal direction, it is out of balance in the crank-wheel in a vertical direction equal to a large portion of the counter-weight employed to correct the horizontal movement," which is certainly an impregnable position. The committee continue:

"In view of this fact we find that engines considered most perfectly balanced by counter-weights in the crank-wheel do occasion great disturbance in a vertical direction (causing a wave force that may be compared to a hammer blow) that has a measure of destructiveness upon rails and bridges dependent on weight and velocity of moving parts, and that it is worthy of the most careful examination and test. The forces induced on both sides of the engine from this cause are of a complex character, varying greatly under modifying conditions that occur in practice, *and do not submit readily to calculation*."

The clause which we have italicized is undoubtedly true in one sense—that experimental results would not probably correspond exactly with any computations—but that there is any such doubt in the matter as to leave room for any great surprises in the tests seems improbable. The whirling counter weights have a certain centrifugal force which can be determined exactly for any speed, and acts directly outward from the centre. The whirling coupling-rods, crank-pin and one end of the connecting-rod (approximately half of it) have likewise a centrifugal force acting directly opposite to and neutralizing, so far as it goes, the centrifugal force of the counter-weights. The difference between the two is entirely unbalanced, and acts to decrease the load per wheel when the counter-weight is upward and to increase it when the counter-weight is downward; in neither case affecting the riding of the engine, since it does not affect the springs, but having a material effect to vary the pressure on the rails, so that it is peculiarly adapted to increase vibration in bridges, and unquestionably does do so.

The reciprocating action of the piston and rod has nothing appreciable to do with this particular question, since it causes a (nearly) horizontal force which is taken up in strain against the crank-pin. In so far as this force does not act horizontally, it tends to decrease the upward force and increase the downward (the latter being the most objectionable) by modifying slightly the distribution of weight on the wheels.

But while an undulatory fluctuation of this nature undoubtedly takes place, it is sometimes exaggerated by considering the centrifugal force of the counter-weights only, without remembering that a large part of it is directly neutralized, and merely produces strain within the wheel, while the term "hammer blow" gives an untrue and exaggerated impression of its nature and effect.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Arizona.—Track laid from Tucson, Ari., north 15 miles.

Burlington, Cedar Rapids & Northern.—The *Sioux Falls Branch* is extended westward to Sioux Falls, Dak., 10¼ miles.

Carthage & Adirondack.—Completed from Carthage, N. Y., east to Jayville, 30 miles.

Chicago & Northwestern.—The *Lake City Branch* is extended from Lake City, Ia., west to Wall Lake, 13½ miles.

Chicago, Rock Island & Pacific.—Extended from St. Joseph, Mo., west to Troy, Kan., 15 miles.

Clearfield & Jefferson.—Extended west to Mehaffey, Pa., 3 miles.

Fort Worth & Denver City.—Extended from Harrold, Tex., northwest to Vernon, 16 miles.

Georgia, Midland & Gulf.—Extended northeast to Bull Creek, Ga., 6 miles.

Kentucky & Indiana Bridge.—Track laid on this bridge and approaches, from Louisville, Ky., to New Albany, Ind., 3 miles.

Litchfield, Carrollton & Western.—Track laid from Litchfield, Ill., westward to Calvinville, 16 miles.

Longdale Iron Co.—Track laid from Sewell, W. Va., to the Tyree coal mine, 8½ miles.

Missouri Pacific.—The *Kansas & Colorado Division* is extended west to Genesee, Kan., 4¼ miles.

Northern Pacific.—The *Cascade Division* is extended westward to Cle-elum, Wash. Ter., 18 miles.

Ohio Valley.—Extended from De Koven, Ky., south to Sturgis, 5 miles.

Parsons & Pacific.—Extended from Mound City, Kan., southwest to Coffeyville, 17 miles.

St. Louis & San Francisco.—The *Arkansas Division* is extended from Fort Smith, Ark., southward 20 miles.

St. Paul, Minneapolis & Manitoba.—The branch from Tintah west is extended from Hankinson, Dak., west to Rutland, 33½ miles.

San Antonio & Aransas Pass.—The main line is extended from Papalote, Tex., southward to Corpus Junction, 25 miles. The *Corpus Christi Branch* is completed by laying track from Corpus Junction south 8 miles.

Seneca Falls & Cayuga Lake.—Completed from Seneca Falls, N. Y., to Cayuga Lake Park, 4 miles.

Southern Pacific.—Track is laid on the southern end of the

Coast Line from Newhall Junction, Cal., northwest 8 miles.

Tavares, Apopka & Gulf.—Track laid from Tavares, Fla., south 10 miles.

Union Pacific.—The *Boulder & Caribou Branch* is extended from Marshall, Col., southeast to Argo Junction, 21 miles.

Williamsport & North Branch.—Extended from Sonestown, Pa., north to Nordmont, 6 miles.

This is a total of 316¼ miles on 23 lines, making 5,014 miles reported so far this year. The new track reported to the corresponding date for 15 years has been :

	Miles.		Miles.		Miles
1886	5,014	1881	6,008	1876	1,931
1885	2,258	1880	4,946	1875	1,128
1884	3,192	1879	2,987	1874	1,594
1883	5,279	1878	1,777	1873	3,288
1882	8,731	1877	1,867	1872	6,106

This statement covers *main track only*, second or other additional tracks and sidings not being counted. The new track reported this year is now over 5,000 miles, and the record exceeds that of 10 out of the 15 years, having been exceeded only in 1883, 1882, 1881 and 1872.

NEW PUBLICATIONS.

Elements of Geodesy. By Prof. J. Howard Gore, B. S. New York. John Wiley & Sons.

This book of 275 pages opens with an exceedingly interesting historical sketch of the progress of science in the measurements of the figure of the earth. It is followed by a long and full chapters on instruments and methods of observation, base measurements and the field work of triangulation, which take up nearly half the book. The remainder of the work is occupied with the theory of the subject, the whole being put in such a way as to justify much more fully than usual the hope of the writer that the reader will "feel grateful that the discoveries and writings of many have been so condensed or elaborated as to make the study of geodesy pleasant."

Indicator Practice and Steam Engine Economy. By Frank F. Hemenway. John Wiley & Sons, New York.

This little work is largely confined to the study of other engines than locomotives, but a separate chapter is given to the latter, and so far as the taking and interpretation of indicator diagrams are concerned, the methods are much the same for all kinds of engines. The work is of an elementary character and can be readily followed by all those having practical familiarity with the steam engine, and for this reason and from the fact that it goes into practical details with a good deal of minuteness, it is calculated to be of much service to those who wish to make indicator tests without much familiarity with the theory of the subject. Some statements which, to say the least, are doubtful, are made in a rather over-positive way, but in the main there is little to object to in the volume, and much to commend.

Foreign Railroad Notes.

During the year ending March 31 last 376 miles of new railroad were opened for traffic in British India, making a total of 12,376 miles. The average cost per mile had been £9,595. The population is about 250,000,000, so that there is as yet only a mile of railroad to 20,000 people, against a mile to 460 in this country.

The management of the Austrian State Railroads has suspended the operation of the Dalmatian Railroad, one of its lines on the Adriatic, from Spalato to Sebenico, because of the danger of spreading the cholera.

The importance of the iron manufacture to the English railroads may be estimated by the fact that in that little country the product of pig-iron and the weight of coal and ore used in making it have been, in tons, for the last two years :

	Pig-iron.	Iron ore.	Coal.
1885	6,412,200	15,558,000	13,087,000
1884	6,824,000	16,577,000	13,907,000

In Scotland the quantities were about one-seventh as great, and altogether last year 17,938,000 tons of ore and 15,288,000 tons of coal were used to make 7,415,000 tons of pig-iron.

In Germany, as in this country, people who go to stations to see their friends off have been in the habit of getting into the cars with them and staying, not as here, till the train actually starts, but till the conductor comes round to call for tickets, which he does before the train starts. Not long ago, two gentlemen of position did this, accompanying a lady to a car and taking seats there for a time. They were complained of by the station-men, under a paragraph of the government railroad regulations which says that to enter a railroad car without a ticket is forbidden under penalty, and they were fined $1.50 each. They appealed and plead that they were ignorant of this regulation, but it was proved that it was posted up with the rest of them (they make a small volume) in two places in the station, and the gentlemen had to pay the fines.

Last February, in consequence of the breaking of a tire, the wheels of the third car from the rear of a passenger train running between Berlin and Breslau, on one of the Prussian state lines got off the track. The conductor on guard, who had a seat by the brake in this car, finding the bell cord fast with ice, passed along the foot-board at the side of the car to the next to the last car, which, like all the other cars except the one off the track, was provided with the Carpenter brake, and set the brake, stopping the train. The management of this railroad, with the approval of the Minister of Public Works, has given him 200 marks ($48), "in recognition of his courageous behavior and the devotion to duty manifested, by which he saved the passengers from injury and the railroad from loss," and called public attention to his act, which to one not familiar with the danger of sidling along the foot-board of a Prussian car as it bumps over the ties seems the most natural thing in the world.

TECHNICAL.

Hand Grenades on Trains.

The Harden hand grenade has lately done some good service in extinguishing fires on trains. In one case on the Columbus & Cincinnati Midland a freight car, containing glass jars in bulk packed in straw, caught fire whilst the train was in motion. The train was stopped, a hole cut in the top of the car and the fire extinguished without serious damage by the use of two of the grenades with which all the trains are equipped. A delay of only 20 minutes was occasioned to the train.

In another case on the Cincinnati, Hamilton & Dayton a car containing lime took fire. The fire was extinguished, and a considerable amount of property saved by the use of six hand grenades. The bottom of the car was burned through in two places.

Boiler Explosions in Great Britain.

The annual report of the British Board of Trade upon the working of the Boiler Explosions Act, 1882, states that during the twelve months ending June 30, 1886, preliminary inquiries under that act have been held in 57 cases. This is the largest number of explosions reported upon in either of the four years during which the act has been in operation, but the life lost per case fell below the average of the three previous years, the figures for the four years being :

Years.	Cases.	Lives lost.
1882-83	45	35
1883-84	41	18
1884-85	43	40
1885-86	57	33

In addition to the number of persons killed, there were 79 persons injured by explosions in 1885-86. Of the boilers which exploded, 16 were in use on board steamers and fishing smacks, and the remainder were used for various purposes on shore. The following is a general classification of the causes to which the explosions are attributable :

	Cases.
Deterioration, corrosion, safety-valve defective, etc.	32
Defective design or construction	16
Ignorance, neglect or carelessness of attendants	6
Miscellaneous	3
	57

No change has taken place in the general nature of the causes to which explosions may be traced, no less than 56 per cent. of the total number of cases being due to neglect on the part of the owners of boilers. Only six cases arose directly from ignorance or carelessness of the boiler attendants, although in a seventh case this was a contributory cause. In ten cases the boilers were under the inspection of insurance companies or guarantee associations, but in three of these the explosions were due to causes other than defects in the boilers or fittings, while in another case the owner ignored the repeated applications of the company for an opportunity to make a thorough examination of the boiler. Three explosions occurred on board vessels classed by Lloyd's, but only one of these was due to a defective design of boiler. Although a large proportion of the explosions were caused by the neglect or mismanagement of the owners—and not one of them can as a fact, be called an inevitable accident—no prosecution has been instituted under the criminal law. The verdicts of "accidental death" which were almost invariably returned, and generally without any qualification by coroners' juries in fatal cases, show that explosions are still regarded by the persons who sit on those juries as being due to causes which are beyond control, and unless evidence of the clearest and most conclusive kind can be produced, an attempt to secure a criminal conviction would be certain to end in failure.

Boilers are sometimes worked long after they are unsafe for any pressure, and with safety-valves which can be tampered with and overloaded, or even fixed down, and indeed in some cases without a safety-valve. An accurate pressure gauge regularly tested is rare. The boilers which have exploded were generally dangerously overworked, and the fittings were as a rule dangerously inefficient.

The number of boiler explosions in Germany is somewhat less than in Great Britain. Last year there were 13 boiler explosions in Germany, against 14 in 1884 and 1883, and 11 in 1882 and 1881. The number of casualties to persons was 22 (against 45 in 1884 and 55 in 1883), the number of fatalities being 11 (against 12 and 23), while 2 persons were badly injured and 9 slightly injured. Of the boilers which exploded 3 were vertical, 8 horizontal and 2 tubular, according to *Kuhlow*, a Berlin contemporary. The cause of explosion was in three cases local weakening of plates, in three cases want of water, in two cases defective construction, and in one case each accumulation of furs, high pressure, faulty action of tubes, weak and defective construction, and careless attendance. During recent years there has been a noticeable falling off in the number of explosions as in that of fatalities.

Engineers' Club of Philadelphia.

A regular meeting was held at the club house in Philadelphia, Oct. 16, Past President Frederic Graff in the chair; 23 members and 1 visitor present.

Mr. J. E. Codman presented an illustrated description of a case of Low Water in a Steel Boiler, wherein the refilling of the boiler, after the exposed portions had reached a high temperature, produced no evidence of a tendency to crack in the steel.

Mr. C. O. Hering presented Tables of Equivalents of Units of Energy and Equivalents of Units of Weights and Measures for the *Reference Book*.

Mr. J. H. Harden read a paper on Early Mining Operation in Berks and Chester Counties, Pennsylvania, giving the names of the charcoal furnaces, dates of construction, owners of the mines using the iron ore, location of the mines, management, cost and quantity of ore mined annually by the Berks & Chester Mining Co., beginning with 1836, under the management of Mr. Wm. McIlvain, continued by Mr. Hartley Potts, Mr. Robert S. Potts, Peter Ubil, Fred. Richards and John Kenny.

He referred to the operations of the Pennsylvania Copper Co., Captain Thomas, Manager, who died in 1808, and was succeeded by Mr. Richard Trewick as Manager and Treasurer; its failure and sale by the Sheriff in 1811.

Mr. Harden identified Mr. William McIlvain as the inventor and first user of the log washer for separating the fine ore from the dirt, and referred to its patent by Mr. John Milholland.

Mr. William E. Lockwood, introduced by the Secretary, gave a brief description and review of the progress made in the efforts to determine the "Hammer Blow" of a Locomotive's Drivers, since January, 1883, when Mr. Lockwood spoke on the subject of the Shaw locomotive before the Club.

Soda Locomotive Engines.

The Minneapolis, Lyndale & Minnetonka road has now in use on its city line in Minneapolis four soda locomotive engines of a pattern similar to those described in the *Railroad Gazette* of July 3, 1885, and in use on several German lines. These motors were built at the Baldwin Locomotive Works in Philadelphia.

Steel-tired Car Wheels.

The firm of W. R. Ellis & Co. having been dissolved, Nov. 1, by mutual consent, Messrs. Page, Newell & Co., No. 139 Milk street, Boston, have succeeded to the business carried on by the former firm in the sale of the wrought-iron spoke car wheel, manufactured by the Patent Shaft & Axle-tree Co., of Wednesbury, England, and known as the Brunswick wheel Messrs. Page, Newell & Co. state that the number of these wheels sold during the last year shows a very large increase over former years, and they claim that the service of the Brunswick wheel compares favorably with any other make, and to support this claim they will be pleased to furnish mileage records. Some of the advantages claimed for these wheels are that they can be re-tired in any railroad shop; that the wrought-iron centre is practically indestructible and will wear out several tires, and that the cost of re-tiring is several dollars less per wheel than any other pattern of steel-tired wheels. Messrs. Page, Newell & Co. have retained the services of Mr. George H. Coney, formerly with W. R. Ellis & Co., who will represent them as traveling agent.

Mr. W. R. Ellis, who, as noted above, resigned the American agency for the Patent Shaft & Axletree Co., of Wednesbury, England, proposes hereafter to supply steel-tired wheels with centre or tires of either American or foreign make, as may be desired by the purchasers. Mr. Ellis retains his former office at No. 18 Broadway, New York.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows :

Baltimore & Ohio, annual meeting, at the office in Baltimore, at 10 a. m., Nov. 15.

Mobile & Ohio, annual meeting of debenture-holders, the office of the company, No. 11 Pine street, New York, Nov. 20, at noon.

Peoria, Decatur & Evansville, special meeting, in Peoria, Ill., Dec. 20.

Richmond & Danville, annual meeting, at the office in Richmond, Va., Dec. 8, at noon. Transfer books close Nov. 8.

Richmond, Fredericksburg & Potomac, annual meeting, at the office in Richmond, Va., Nov. 17, at noon.

Richmond & West Point Terminal Co., special meeting, in Richmond, Va., Nov. 19.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows :

Boston & Maine, 5 per cent., semi-annual, payable Nov. 15, to stockholders of record on Oct. 28. This company paid 4 per cent. last November and 4½ in May.

New York, Providence & Boston, 2½ per cent., quarterly, payable Nov. 10. This company increases from 2 to 2½ per cent.

Pennsylvania, 2½ per cent., semi-annual, payable Nov. 29, to stockholders of record on Oct. 30. This company paid 2½ in May and 2 per cent. last November.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows :

The *Association of Railroad Trackmen of North America* will meet at Council Bluffs, Ia., on Thursday, Nov. 25.

The *Master Car-Builders' Club* holds its regular meetings at the rooms, No. 113 Liberty street, New York, on the third Thursday in each month.

The *New England Railroad Club* holds its regular meetings at its rooms in the Boston & Albany passenger station in Boston, on the second Wednesday of each month.

The *Western Railway Club* holds its regular meetings at its rooms in Chicago on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

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Foreclosure Sales.

The *Toledo, Peoria & Western* road was sold in Chicago, Oct. 29, under decrees of foreclosure granted by the United States Circuit Court, and was bought for $4,790,000, by Mr. John Bowers, of New York, representing the bondholders' committee. Another bidder was present, but declined to state whom he represented. The road extends from State Line, Ill., to Warsaw, 227 miles, with a branch of 20 miles to Burlington, Ia. It was originally the Toledo, Peoria & Warsaw road, was sold under foreclosure some years ago and reorganized under the present name. It was afterward sold to the Wabash, St. Louis & Pacific Co., but was last year reclaimed from the possession of that company by the bondholders, default having been made on the interest, and has for some time been under a separate receivership.

The *Havana, Rantoul & Eastern* road was sold under foreclosure in Springfield, Ill., Oct. 28, and bought for $100,000 for account of the bondholders, who have organized a new company to operate it. The road extends from Lebanon, Ind., to Leroy, Ill., 76 miles; it was recently a part of the Wabash system.

New England Railroad Club.

The Club will hold meetings at its rooms, Boston & Albany passenger station, Boston, Wednesday, Nov. 10, 1886, in the afternoon at 2 o'clock, and in the evening at 7:30.

It was thought desirable that two sessions be held to consider this important matter, and it is hoped that both sessions will be largely attended.

Subject for Discussion : *Interchange of Cars* (continued from last meeting). The discussion will have especial reference to the inspection of cars at interchange points, the defects in ladder rounds and handles, defective brake attachments, gauge of wheels, defective running boards, etc., and how far it is possible to remedy these *defects*.

Is it more rigid inspection, or more thoroughly constructed cars, or cars kept in more perfect condition, that is wanted to overcome existing difficulties in the interchange of cars? In view of the urgent necessity of immediate action in this matter, it is thought desirable to take this subject up and make a determined effort to arrive at some conclusions as to methods and plans for the adjustment of these perplexing questions. Superintendents of rolling stock, master car-builders, inspectors, and all others interested, are especially invited to be present, or if unable to do so to communicate their views in writing.

Brotherhood of Locomotive Engineers.

The sessions of the convention continued until Nov. 1, the only further diversions from business being a visit to the theatre and a short excursion to Rockaway Beach.

On Oct. 28 officers were chosen, Chief Arthur and nearly all the old officers being re-elected.

Important changes were made in the Insurance Department in rearranging classes and regulating the amount of insurance.

The convention has been one of the most successful held by the Brotherhood, and leaves it in excellent condition.

Railroad Conductors' Life Insurance Association.

The Railroad Conductors' Life Insurance Association of the United States and Canada met in annual session in Baltimore, Oct. 27, at Ford's Grand Opera House, Frank Champlin presiding. Rev. John Leyburn opened with prayer. Mayor Hodges made an address of welcome, which was appropriately responded to.

Committees on credentials, special work, finance, by-laws and resolutions were appointed. President Champlin made an address, after which invitations were read from the Commandant of Fort McHenry to visit there; also, from the Western Maryland and the Baltimore & Ohio railroads to excursions along their respective lines.

On the second day the Auditing Committee reported all accounts correctly kept and the finances of the body in first-rate condition. The report was adopted. Portland, Me., was selected as the place of the next convention.

At an afternoon session officers were elected for the ensuing year. The question of what constitutes total disability was taken up and referred back to the Committee on By-laws. They withdrew the recommendation to define it, and recommended that the Executive Committee shall not consider any case of physical disability, with the understanding that only cases arising from accidents be considered, which was adopted. To restore delinquent members it was resolved that for one year all such could be reinstated by payment of the regular initiation fee of $2. Mr. A. C St. Clair, of the Chicago & Northwestern, was named the Orator for 1887, with Mr. John P. Coombs a ternate.

In the evening an entertainment was given to the delegates, and on the following day they went on an excursion to Washington.

ELECTIONS AND APPOINTMENTS.

Addison.—This company, whose road is operated by the Central Vermont Co., has elected P. W. Clement President; John A. Mead, Clerk and Treasurer.

American Street Railway Association.—At the annual convention in Cincinnati the following officers were chosen: President, Thomas W. Ackley, Philadelphia; First Vice-President, Albert G. Clark, Cincinnati; Second Vice-President, William H. Sinclair, Galveston, Tex.; Third Vice-President, Prentice W. Cummings, Cambridge, Mass.; Secretary and Treasurer, W. J. Richardson, Brooklyn, N. Y.; Executive Committee: Julius Walsh, St. Louis; Henry Hurt, Washington; C. D. Wyman, New York; Dr A. Everett, Cleveland; S. S. Spaulding, Buffalo, New York.

Atlantic & Pacific.—The following is dated Albuquerque, N. M., Oct 26: "Mr. T. R. Gabel is hereby appointed Acting General Superintendent, with headquarters at Albuquerque. Appointment to take effect Nov. 1, 1886."

Baltimore & Ohio.—Mr. J. F. Legge is appointed General Agent at Washington, and for the Washington and Metropolitan Branches, to date from Nov. 1.

Brotherhood of Locomotive Engineers.—The convention in New York last week elected officers for the ensuing year as follows: Grand Chief Engineer, P. M. Arthur, of Cleveland; First Grand Engineer, T. S. Ingraham; Second Grand Engineer, J. R. Sprague; First Grand Assistant Engineer, H. C. Hays; Second Grand Assistant Engineer, A. R. Cavner; Third Grand Assistant Engineer, John Hill, of Chicago; Grand Guard, J. C. Parker, of Aurora, Ill.; Grand Chaplain, Delos Everett. The Chief's term is for three years; the other terms are for one year.

Carthage & Adirondack.—The officers of this company are as follows: B. D. Benson, President, New York; S. Q. Brown, Treasurer, New York; C. B. Benson, General Manager, Carthage, N. Y.; B. C. Williams, Auditor, New York C. B Benson, General Manager, is at present in charge of the General Ticket and Passenger departments. Remittances for balances should be made to and drafts drawn on S. Q. Brown, Treasurer, New York. B. C. Williams, 12 Broadway, New York, is Purchasing Agent.

Central Iowa.—Mr. T. H. Simmons is appointed General Freight Agent, in place of Mr. H. L. Shute, who has gone to the Minneapolis, Sault Ste. Marie & Atlantic road.

Central Massachusetts.—At the annual meeting in Boston, last week, the following were elected: President, Samuel N. Aldrich; directors, Elisha S. Converse, Charles P. Darling, Wm. M. Gaylord, Lyman Hollingsworth, Henry F. Hills, Wm. T. Parker, Thomas H. Perkins, Moses W. Richardson, J. Edwin Smith, Charles E. Sweet, Henry Woods; Clerk and Treasurer, George F. Seymour.

Chicago Air Line.—The office of this new company is in Goshen, Ind.; the officers are: President, Milton Mercer; Vice-President, Wilbur L. Stonex; Secretary, W. R. Ellis; Treasurer, W. Hawks.

Cincinnati, Hamilton & Dayton.—Mr. W. H. Corry has been appointed General Master Mechanic, in place of Mr. John Black, Sr., resigned.

Columbus & Florida.—Mr. J. L. Cowan is Engineer in charge of the surveys of this road. His headquarters are in Columbus, Georgia.

Columbus & Rome.—At the annual meeting, Oct. 9, the following officers were elected: President, John Peabody, Columbus, Ga. Directors, W. R. Brown, W. H. Brannon, W. L. Clark, Columbus, Ga.; A. F. Hill, Greenville, Ga.; S. J. Whiteside, Savannah, Ga. The board elected W. L. Clark General Manager; J. M. Frazer, Secretary and Treasurer.

Danbury & Norwalk.—At the annual meeting in Norwalk, Conn., Oct. 29, the following directors were elected: St. John Lockwood, Charles H. Merritt, Charles L. Rockwell, William H. Baraum, David W. Plumer, Charles A. Potter, William B. Lockwood, Richard Henley, Eben Hill, J. H. Perry, Stephen H. Smith. The directors afterward chose the following officers: President, St. John Lockwood; Secretary and Treasurer, H. Williams.

Duluth, Red Wing & Southern.—The office is in Red Wing, Minn.; the incorporators are Charles Ketcher, S. B. Foot, F. W. Hoyt, Peter Nelson and F. B. Sheldon.

Fitchburg.—General Superintendent John Adams has issued the following circular: "Mr. John Litin is appointed Car Accountant of this company, to take effect Nov. 1, 1886. Car tracers, junction reports, and all communications concerning movements of cars should be addressed to him. Reports of all mileage earned after Oct. 31 inst. should be sent to C. S. Antnony, Auditor, and balances of same settled with M. D. Benson, Treasurer."

Hanover Branch.—At the annual meeting in South Hanover, Mass., Oct 25, Mr. Richmond J. Lane, one of the directors, resigned, and Mr. Lewis Reed was chosen in his place The officers chosen were: President, E. Y. Perry, South Hanover, Mass.; Clerk, C. T. Phillips, South Hanover, Mass.; Treasurer, Albert Culver, South Hanover, Mass.; directors, E. Y. Perry, E. Q. Sylvester, L. C. Waterman, A. Culver, and Lewis Reed.

Illinois Central.—Mr. E. T. H. Gibson has been chosen Secretary of this company, in place of Mr. William J. Mauriac, resigned.

Kanawha & Ohio.—At a meeting of the board held Oct. 29, the following directors were chosen: President, Erwin Davis, New York; Vice-President, Nelson Robinson, New York; General Manager, Thomas R. Sharp, Charleston, W. Va.; Secretary and Treasurer, E. R. Leland, New York.

General Manager Thomas R. Sharp issues the following: "Mr. Wm. Bonner has been appointed Auditor, to whom all agents' and conductors' reports will be forwarded. Mr. J. A. Jeffords has been appointed Cashier, to whom all money will be forwarded. Mr. S. L. Southard has resigned the position of Auditor and Cashier, and has been appointed Supervisor of Road between Corning and Middleport, including the Buckingham Branch. Mr. L. Fairo, Supervisor of Road, will retain charge of the line from Point Pleasant, O., to Charleston. Mr. O. T. Wilson, Supervisor of Bridges, etc., will retain charge of the bridges and buildings from Point Pleasant, O., to Charleston."

Kansas City, Indian Territory & Louisiana.—The directors of this new company are: John N Fullinwider, R. J. McIntyre, Benjamin M. Weeks, Eldorado, Kan.; Malvern M Porterfield, Kansas City, Mo.; Julius M. Turner, Columbus, Ind.; Robert Fullinwider, Crawfordsville, Indiana.

Kansas, Colorado & Texas.—The directors of this new company are: A. Bennett, A. J. Hoisington, W. S. Smith, of Garden City, Kan.; B. C. Parell, Samuel P. Carr, C. R. Chipman, A. J. Devers, of Lakin, Kan.; M. W. Wells, Valparaiso, Kan.; S. N. Wood, Strong City, Kan.; Seth Furness, Hugoton, Kansas.

Keokuk & Western.—The officers of this company, successor to the Missouri, Iowa & Nebraska, are: F. T. Hughes, President and General Solicitor; F. M. Jessup Treasurer; J. F. Howell, Secretary. It is not thought that there will be any change in the operating management of the road.

Louisville, New Albany & Chicago.—The following circular is issued by Vice-President and General Manager John B. Carson, and dated Nov. 1:

"Mr. W. H. McDoel, General Freight Agent, is hereby appointed Traffic Manager. He will have charge of both Freight and Passenger departments. Appointment to take effect this day."

The Traffic Manager, W. H. McDoel, issues the following also, under date of Nov. 1:

"Mr W. S. Baldwin having resigned to accept a position with Pullman's Palace Car Co., Mr. E. O. McCormick is hereby appointed General Passenger Agent, appointment to take effect this day."

Minneapolis & Pacific.—Mr. Charles T. Fox is appointed Local Treasurer, with office at Minneapolis, Minnesota.

Minneapolis, Sault Ste. Marie & Atlantic.—Mr. John G. Taylor having accepted the position of General Passenger and Ticket Agent of the Minneapolis, Sault Ste. Marie & Atlantic and the Minneapolis & Pacific railroads, with headquarters at Minneapolis, Mr. H. L. Shute is appointed General Freight Agent of this company, with office at Minneapolis.

Mobile & Girard.—W. L. Clark, Superintendent, announces that, commencing Sept. 1, 1886, all mileage reports for car service over the Mobile & Girard would be made by Theo. Wells, Car Accountant Central Railroad & Banking Co., Macon, Ga., to whom reports for mileage of M. & G. cars should be sent. Remittances for balances from Sept. 1 should be sent to E. McIntyre, Treasurer, Savannah, Ga., and drafts for balances should also be drawn on him All balances prior to Sept. 1 will be settled by J. M. Frazer, Treasurer M. & G. Co., Columbus, Georgia.

New York, Lake Erie & Western.—Mr. Thomas M. De witt has been appointed Superintendent of the Erie Express for the New York, Pennsylvania & Ohio lines, with office in Cleveland, O., in place of J. F. Legge, resigned.

Oregon Railway & Navigation Co.—Mr. Ben. Campbell is appointed General Freight Agent, with office in Portland, Or. He was recently on the Union Pacific.

Parsons & Pacific.—The officers of this company are as follows: R. S. Stevens, President; H. D Mirick, Vice-President; T. Penfield, Secretary and Manager; Lee Clark, Treasurer; D. W. C. Perry, Chief Engineer. The general offices are at Parsons, Kan.

Philadelphia & Reading.—Mr. A. A. McLeod, Assistant to the President, has been appointed Acting General Manager during the absence of Mr. John E Wootten.

Railroad Conductors' Life Insurance Association.—At the convention in Baltimore last week Mr. George F. Hanford, of the New York Central, was elected President The other officers elected were as follows: First Vice-President, Thomas S. Roche, Eastern Division Canadian Pacific; Second Vice-President, B. F. Bond, of Baltimore, Division Passenger Agent Baltimore & Ohio Railroad; Third Vice-President, W. W. Sweeney, Louisville & Nashville; Secretary, H. P. Feltrow, now of Columbus, but for 21 years conductor on Philadelphia, Wilmington & Baltimore Railroad. This is the fifth year of his selection for the office. For Executive Committee, composed of three, one of whom is elected each year, R. J. Snively, of Columbus.

Richmond & Danville.—The following order from General Manager E. B. Thomas is dated Washington, Nov. 1: "This company having leased the railroad and property of the Washington, Ohio & Western Railroad Co., to take effect from this date, and the transfer having been made, the road will hereafter be operated by this company as the Washington & Ohio Division.

"The general officers of this company, in their respective departments, will assume charge of the business of that division.

"The following division officers, with offices as noted, will, under the direction of the respective heads of departments, take charge of their several branches of the service: Robt. Bell, Superintendent, Alexandria, Va.; J. S. B. Thompson, Assistant General Freight and Passenger Agent, Alexandria, Va.

"Instructions to agents and connections in regard to the Accounting Department will be issued by the Comptroller."

Sleeping Car Conductors' Mutual Aid Association.—At the first annual convention in Chicago, Oct. 26, the following officers were chosen for the ensuing year: President, W. B. Booz, Baltimore; Vice-Presidents, F. C. Franklin, Chicago; J. H. Livingston, Chicago; Secretary and Treasurer, S. W. Riley, Chicago; Directors, W. K. Tubman, Baltimore; J. D. Haggerston, Chicago; P. L. Andrews, New York; W. H. Crusey, Baltimore; and E. P. Vallentine, Chicago.

Savannah, Dublin & Western.—Mr. George W. Van Fossen is General Manager of the United States Railroad Construction Co., which has taken the contract to build this road.

Train Dispatchers' Association.—The Buffalo Division of this Association has elected the following officers: President, E. F. Knibloe, Erie, Buffalo; Vice-President, John B. Slocum, Buffalo; Secretary and Treasurer, E. D. Wells, Buffalo, Rochester & Pittsburg, Buffalo; Executive Committee, J. W. Lynahan, W. C. Bryant, J. S. Watson. The division will hold meetings every month.

Union Pacific.—Mr. J. S. Wilson has been appointed General Agent at Portland, Or., in place of Mr. B. Campbell, who has gone to the Oregon Railway & Navigation Company.

Venice, Marine & Eastern.—The directors of this new company are: F. Kohl, Frank McCambridge, Venice, Ill.; E. M. Eaton, Peter Fisher, Marine, Ill.; Henry C. Gerke, Wm. H. Jones, Edwardsville, Ill.; Wm. Bosbyshell, St. Louis.

Wallace & Northern.—The office is at Spokane Falls, Wash. Ter. The incorporators are D. C. Corbin, W. B. Wallace, E. D. Carter, J. N. Glover, F. R. Moore and H. M. McCartney.

Washington & Elberton.—The headquarters are in Elberton, Ga.; the corporators are C. E. Smith, John M. Callan, Geo. E. Dillard, B. S. Irvin, R. T. DuBose, T. B. Green, F. H. Colley, James A. Benson, M. P. Reese, E. G. Burns, T. M. Green, Henry J. Hill, D. B. Cade, F. B. Pope, W. N. Mercier, Isaac G. Swift, McAlpin Arnold, W. C. Smith and E. B. Tate.

West Alabama Short Line.—The incorporators of this new company are: Robert Jemison, J A. Montgomery, James E. Webb, Birmingham, Ala.; W. C. Jemison, Tuscaloosa, Alabama.

Western Maryland.—Mr. John M. Hood, President and General Manager, has issued a general notice, dated from his office at Hillen Station, in Baltimore, Nov. 1, 1886, as follows:

"This company having assumed control this date of the railway and property of the Baltimore & Harrisburg Railroad Co. by virtue of lease and by ownership of stock, notice is hereby given that H. D. Scott will be continued as Superintendent of this division of the Western Maryland Railroad. He will have a general supervision of the train and telegraph, machinery and road departments, and will report to the General Manager. He will, as far as practicable perform the duties prescribed for Trainmaster under regulations of this company. Where any of the above departments have separate heads, such officers will report to and receive their instructions from the Superintendent. Agents, conductors and others making collections will remit to John S. Harden, Treasurer, Hillen Station, and make such reports to J. D. Whittington, Auditor and General Ticket Agent, Hillen Station, as may be required by him. The duties of the General Freight and Passenger Agent, B. H. Griswold, will be extended to cover this division, and Joseph Leib will perform the duties of Division Freight and Passenger Agent, reporting to the General Freight and Passenger Agent. His office will be at Hanover. All other employés will perform the duties of their respective positions as prescribed by the book of rules of this company, copies of which will be supplied to those requiring them."

West Virginia.—Mr. A. G. Hatry, of Pittsburgh, Pa., is President of this company. Mr. Jonathan Barrett is Chief Engineer.

Wichita Falls & Winfield.—The office is in Wichita Falls, Tex.; the directors are Isaac Jalonick, J. S. Mayfield, R. E. Huff, W. A. McCutcheon, John G. James, C. P. Green, G. T. Knott, J. A. Kemp and J. A. Foreman.

Wisconsin Central.—Mr. George T. Huey has been appointed General Northwestern Freight Agent, with headquarters at Minneapolis, Minn. Mr. Elmer Overpeck, formerly with the Merchants' Dispatch, has been appointed Contracting Freight Agent of the road.

PERSONAL.

—Mr. B. S. Fitch has resigned his position as General Freight Agent of the Chesapeake & Ohio Railroad.

—Mr. John E. Wootten, General Manager of the Philadelphia & Reading Railroad, has been given leave of absence until Jan. 1 next.

—Mr. Richard P. Martin, Auditor of the Hartford & Connecticut Western Co., was married in New York last week to Miss Edith E. Oakley, of that city.

—Mr. C. A. Lawton has resigned his position as Agent for the West Shore Line in St. Louis, and has engaged in the manufacture of babbitt and other metals in St. Louis.

—Mr. Patrick Henry Walker, a well-known citizen of Baltimore, and a state director of the Baltimore & Ohio Co., died at his residence at Pikesville, Md., Oct. 27, aged 53 years.

—Mr. J. H Holway, for a number of years Purchasing Agent of the New York, Pennsylvania & Ohio road, has resigned his position to accept a position on the Colorado Midland road.

—Mr H. H. Mitchell, for some time past Assistant General Freight and Passenger Agent of the Michigan & Ohio road, has resigned to accept a position on the Duluth, South Shore & Atlantic road.

—Mr. Thomas Fielden, who recently resigned his position as Division Master Mechanic of the Texas & Pacific road at Big Springs, Tex., has been presented with a valuable gold watch by the employés on his division.

—Mr. James H. Leighton, for some time past Superintendent of the works of the Jackson & Sharp Car Co. in Wilmington, Del., resigned Nov. 1, to accept a position with the Baker Car Heater Co. of New York, manufacturers of the new Baker heater for cars

—Mr. John Black, Sr., has resigned his position as General Master Mechanic of the Cincinnati, Hamilton & Dayton road, and will retire from active business. Mr. Black has been with the road over twenty years, having been appointed Master Mechanic of the Dayton & Michigan Division in 1865, and made General Master Mechanic four years ago.

—Major Joseph G. Pangburn has resigned his position as Assistant General Passenger Agent of the Baltimore & Ohio Railroad to date from Oct 31. He has been with the Baltimore & Ohio for many years and has been known as a very active and efficient officer. He has resigned to take charge of the advertising business of the Charles J. Vogeler Co., of Baltimore.

—Mr. John R. Balch died at his residence in Providence, R. I., Oct. 26, aged 76 years. He entered the service of the

company as a clerk in 1846, and in 1851 was chosen Treasurer. He had held that office continuously ever since, being highly esteemed by the officers of the company. It is said that, although connected for more than 40 years with the Providence & Worcester Railroad, Mr. Balch never was in one of its cars.

—It is announced that Col. Frank K. Hain has been offered the position of General Manager of the Philadelphia & Reading road, but has declined it, preferring to retain his present position as General Manager of the Manhattan Elevated lines in New York. Col. Hain began work as an apprentice in the Reading repair shops; he served during the war in the Navy, and was afterward for several years connected with the Baldwin Locomotive Works, and was for a time Superintendent of Motive Power of the Philadelphia & Erie Division of the Pennsylvania Railroad. In 1874 he went to Russia for the Baldwin Works and after his return was made Superintendent of Motive Power of the Erie road. In 1876 he left that road to become General Superintendent of the Keokuk & Des Moines, and remained in charge of that line until 1880, when he accepted the position he now holds. Col. Hain has been very successful on the Elevated roads, where he had to organize and conduct a work in many respects entirely new to railroad men.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885	Inc. or Dec.	P. c.
Ten months to Oct. 31:				
Chi., Mil. & St. P.	$20,000,876	$19,478,595	I.	$522,281	9.9
Chic. & N. W.	20,805,968	20,057,252	I.	768,716	3.8
Den & R. G.	5,450,559	5,041,891	I.	408,668	8.1
Mil., L. S. & W.	4,916,746	4,122,776	I.	813,970	19.5
Northern Pac.	10,173,457	9,365,968	I.	847,489	9.1
St. L. & San F.	3,915,207	3,541,659	I.	367,548	10.4
St. P. & Duluth	1,249,559	1,094,816	I.	154,743	14.1
Nine months to Sept 30:				
Atch., T. & S. F.	$11,012,675	$11,078,534	I.	$14,141	0.1
Net earnings	5,103,080	5,055,645	I.	69,435	1.4
Ches. & Ohio	3,055,287	2,454,913	I.	570,362	23.2
Net earnings	916,135	688,564	I.	227,571	33.1
Ches., O. & S. W.	1,186,029	1,108,911	I.	77,113	7.0
Net earnings	417,682	379,020	I.	38,662	10.7
Lviz, Lex. & B. S.	676,150	569,509	I.	106,641	18.6
Net earnings	135,176	104,802	I.	30,574	27.3
G and Rap. & I.	1,480,967	1,405,843	I.	75,124	5.3
Net earnings	512,248	408,144	I.	104,104	25.5
Mem. & Charles.	930,124	896,159	I.	34,965	3.8
Net earnings	255,407	115,530	I.	139,877	103.4
Mexican Central	2,489,709	2,449,497	I.	40,272	1.5
Net earnings	844,134	1,124,098	D.	279,964	24.9
N. Y. Sus. & W.	749,292	803,519	D.	4,227	0.5
Net earnings	332,944	369,376	D.	36,432	9.8
Norfolk & West.	2,312,499	1,966,077	I.	347,224	18.0
Net earnings	919,913	751,542	I.	168,371	22.0
Northern Pacific	8,686,313	7,802,685	I.	883,628	11.3
Net earnings	4,113,779	3,650,011	I.	463,768	12.6
Pennsylvania	36,880,292	33,236,740	I.	3,628,652	10.9
Net earnings	12,971,827	11,220,976	I.	1,750,851	15.6
Phila. & Reading	21,911,808	21,023,189	I.	888,679	3.9
Net earnings	8,926,929	8,577,141	I.	349,788	4.1
St. Jo. & Gd. I.	899,651	781,428	I.	58,213	7.5
Net earnings	368,427	206,434	I.	161,993	78.6
West Jersey	1,077,389	1,018,061	I.	59,378	5.8
Net earnings	418,847	393,893	I.	24,954	6.3
Eight months to Aug 31:				
Day on & Ton.	$141,923	.....	.....	....
Deficit	4,775	.....	.....	...
Month of August:				
Dayton & Iron	$20,447	$21,527	D.	$1,080	5.0
Net earnings	3,961	6,271	D.	2,310	36.7
Month of September:				
Atch., T. & S. F.	$3,466,240	$1,385,585	I.	$80,661	5.8
Net earnings	596,561	710,656	I.	46,095	6.2
Ches. & Ohio	388,492	309,497	I.	79,095	25.5
Net earnings	140,016	122,042	I.	17,974	14.7
Ches., O. & S. W.	169,943	151,892	I.	22,051	15.8
Net earnings	49,823	32,516	I.	17,307	52.6
Eliz., Lex. & B. S.	95,801	72,519	I.	23,282	31.9
Net earnings	37,758	36,629	I.	1,129	3.1
G and Rap. & I.	191,597	190,117	I.	1,480	0.6
Net earnings	76,177	76,723	D.	546	0.7
Jack., T. & K. W.	23,747	4,959	I.	18,788	382.9
Memphis & Chas.	12,080	10,495	I.	15,485	14.8
Net earnings	37,935	27,744	I.	25,191	9.
Mexican Central	360,876	238,794	I.	62,082	26.1
Net earnings	110,4 4	85,894	I.	24,591	28.5
N. Y. Sus. & W.	102,87 7	105,354	D.	2,537	2.4
Net earnings	42,328	51,988	D.	9,660	18.6
Norfolk & West.	319,225	267,374	I.	51,851	19.4
Net earnings	137,855	130,366	I.	7,489	6.0
Northern Pacific	1,372,672	1,224,955	I.	147,717	12.1
Net earnings	709,651	692,009	I.	70,972	11.1
Pennsylvania	4,674,052	4,276,628	I.	397,424	9.3
Net earnings	1,851,4 4	1,851,970	D.	75,516	4.0
Phila & Reading	2,920,616	2,806,387	I.	129,229	4.6
Net earnings	1,322,516	1,105,993	I.	22,592	1.7
St. Jo. & Gd I.	106,318	122,587	D.	16,259	13.2
Net earnings	48,130	66,576	D.	18,346	27.3
West Jersey	133,725	125,113	I.	8,602	6.9
Net earnings	56,549	38,014	I.	18,335	48.2
Month of October:				
Chi. Mil. & St. P.	$2,799,000	$2,892,473	D.	$93,473	3.2
Chic. & N. W.	2,884,800	2,866,600	I.	18,200	0.6
Den & R. G.	773,282	686,364	I.	86,848	12.3
Mil., L. S. & W.	251,552	158,025	I.	93,527	59.2
Northern Pacific	1,487,344	1,522,283	D.	35,141	2.3
St. Louis & San F.	533,400	481,900	I.	51,500	10.7
St. P. & Duluth	284,905	242,394	I.	22,511	9.3
Third week in October:				
Carson, V. & ...	$18,300	$11,804	I.	$6,496	55.1
Chic. & Alton	206,137	192,527	I.	13,810	7.2
Chi. & East. Ill.	44,775	43,762	I.	1,013	2.3
Chic., P., M. & O.	132,700	148,400	D.	15,700	10.4
E. Ten., Va. & G.	108,377	94,445	I.	13,932	14.7
Illinois Central	289,100	267,622	I.	21,478	8.0
Iowa lines	46,600	43,511	I.	3,089	7.1
Ind., Bloom. & W.	61,702	54,906	I.	7,350	13.4
Wisconsin Cent.	28,709	28,043	I.	666	2.4

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Chicago-Ohio River Pool.

The general passenger agents of the Chicago-Ohio River pool lines met in Chicago, Oct. 27, and passed a resolution restoring all rates throughout the pool territory to regular tariff; also agreeing that the Commissioner should be authorized to redeem at tariff rates any tickets, either of their own or outside roads, found in scalpers' offices. The restoration is to go into effect at once.

Central Traffic Association.

At a meeting of the representatives of the Chicago, St. Louis, Cincinnati, Indianapolis and Louisville east-bound lines, held at the Burnet House, Cincinnati, Oct. 29, for the purpose of the restoration of east-bound rates, in accordance with the resolution of the general managers, adopted Oct. 21, resolutions were unanimously adopted, subject to the approval of absent members, providing for the restoration of east-bound rates from St. Louis, and discontinuing the payment of commissions on east-bound business to other than regular ticket agents at Chicago, St. Louis, Cincinnati, Indianapolis and Louisville.

As some important lines were not represented, it was deemed advisable to have the action of this meeting ratified by the Passenger Department of the Central Traffic Association, and on motion it was resolved that a general meeting be called, to be held at the Burnet House, Cincinnati, Nov. 3. A call was accordingly issued by the Assistant Commissioner.

Southwestern Passenger Association.

In Chicago, Oct. 28, the general managers and general passenger agents of the roads between Chicago, St. Louis and Southwestern Missouri River points to-day perfected the new agreement for pooling the southwestern passenger traffic. Printed copies of the new agreement were submitted, and after making some minor corrections it was signed by the general managers of the various roads. The St. Louis & San Francisco Railway was represented by its General Passenger Agent, Mr. Wishart. A strong effort was made to induce the company to join the pool. Mr. Wishart, however, demanded such concessions as the other roads were unable to grant, and the St. Louis & San Francisco is not in the pool.

Southwestern Railway Association.

The general managers of the lines in the Southwestern Railway Association held a meeting in Commissioner Midgley's office in Chicago, Oct. 28 and 29, and made some progress towards putting the Southwestern freight pool in a better condition. In a statement made by Commissioner Midgley, he showed that the gross earnings of the lines in the Association during the 10 years of its existence had amounted to not less than $882,060,000, and that the total differences between the lines in settlement of balances amounted to only $461,295, or 0.56 per cent. of the total earnings. This showed how closely the earnings of the lines approximated the percentages that were allowed to them. Had the accounts of the Hannibal & St. Joseph road been merged with these of the Burlington road, as they are now, the differences would have been reduced to $331,515, or to 0.44 per cent. of the total earnings. These earnings, based on the total tonnage, showed that the rate per ton was not quite 18 cents, or about 0.09 cent per 100 pounds. Prior to Jan. 1, 1883, the pool had its Chicago, its St. Louis, and its Hannibal Divisions. Since then these have been merged into one. From Jan. 1, 1883, to Oct. 1, 1886, during which time each line had its fixed percentage, the differences were $224,969, or at a rate of 28 cents per ton carried, or 1.4 cents per 100 pounds. The actual earnings on this business were 84.66 per ton during that period.

After this statement had been made, the meeting devoted its attention to the difficulties affecting the situation at present, and a number of suggestions were made and taken up, the principal subject being the nature of the new business to be included in the pool and its treatment. It was agreed that no settlement of the percentage question could be made until these subjects could be disposed of. Next came a consideration of the Kansas freight rate war, which has so long offended the lines this side of the Missouri River. The question was, What business destined to and from points west of the Missouri River should be pooled between what lines, and how, and then call in the Santa Fe road, the Frisco Line, and the Fort Scott & Gulf road. It was, therefore, agreed that when an adjournment was had, it be until Nov. 3, at St. Louis, when a settlement of the Kansas rate war would be attempted by calling all the interested lines into the meeting. It was absolutely necessary that this matter should first be disposed of.

The troubles in the lumber pool and the difficulties caused by having two sets of differentials in force next came up, and it was decided as essential to the success of the pool that uniform differentials be first agreed upon. It was announced also that the Wisconsin Central and the Chicago, Burlington & Northern roads had specified their intention of coming into the pool, an evidence that the situation had completely changed. The lines being unable to do anything at present, it was agreed that a general lumber meeting, at which all interested lines shall attend, be held in Chicago during the second week in November, for the completion of a new lumber pool. At this meeting, all lines leading to the Missouri River are to be represented. An adjournment was then had.

Southern Railway & Steamship Association.

The Rate Committee held a meeting at Atlanta, Ga., last week. The work done was chiefly of a routine character.

Southern Passenger Committee.

A meeting was held in Atlanta, Ga., last week, the work done being a general adjustment of rates, and the adoption of winter excursion rates and forms of tickets. A committee was appointed to meet the committee representing the Chicago-Ohio River Pool, to settle disputed questions.

San Francisco Passenger Commissions.

At a meeting held in San Francisco last week, the local agents of the trunk and transcontinental railroads unanimously adopted an agreement which provides for a discontinuance of all commissions on the part of all the roads, except the Iowa lines, which are allowed to retain $1 commission on each first-class passenger. It also provides that each road shall retain its own office, and that the Canadian Pacific and Pacific Mail shall not be recognized as competing lines.

Indianapolis Car Movement.

The Indianapolis weekly dispatch says: "The train records show that 296 more loaded cars were received and forwarded at Indianapolis in the week ending Oct. 30 than in the preceding week, and 2,617 more loaded cars than in the corresponding week in 1885, and but for the car famine the movement would have been even larger. Eastward there was an increased movement of grain and a heavy movement of lumber. The shipments of live stock were lighter than in the week ending Oct. 23. Westward the tonnage continues heavy, and north and south roads continue to do a good business of a miscellaneous character. Shipments of provisions and grain southward are not so heavy as the corresponding period last year. With the improvement in business in the car-works in the northern states shipments of southern pine northward have largely increased. Local traffic is at its best, oats, new corn, coal and live-stock forming important features of the freight handled."

Cotton.

Cotton movement for the two months of the crop year from Sept. 1 to Oct. 29 is reported by the *Commercial and Financial Chronicle* as follows, in bales:

	1886.	1885.	Inc. or Dec.	P. c.
Interior markets:				
Receipts	948,504	919,297	I.	29,207	3.2
Shipments	747,967	728,840	I.	19,127	2.6
Stock, Oct. 29	228,997	206,307	I.	22,690	11.0
Seaports:				
Receipts	1,343,801	1,388,473	D.	44,672	3.2
Exports	684,716	670,754	I.	13,962	2.0
Stock, Oct. 29	623,535	596,227	I.	27,308	4.6

A considerable part of the shipments from interior markets reappears in the seaport receipts. Exports include shipments to foreign countries only, and not those to other domestic ports.

The *Chronicle* says: "In the table below we give the receipts from plantations, and add to them the net overland movement to Oct. 1, and also the takings by southern spinners to the same date, so as to give substantially the amount of cotton now in sight:

	1886.	1885.	1884.	1883.
Receipts at the ports to Oct. 29	1,343,801	1,388,453	1,435,830	1,465,907
Interior stocks on Oct 29 in excess of Sept. 1	180,937	190,457	138,843	227,578
Total receipts from plantations	1,524,738	1,578,910	1,574,673	1,693,485
Net overland to Oct. 1	19,635	22,910	12,391	19,235
Southern consumption to Oct. 1	32,000	29,000	28,000	30,000
Total in sight Oct. 29	1,576,373	1,630,820	1,615,064	1,742,720
Northern spinners' takings to Oct. 29	224,151	265,642	223,068	317,000

"It will be seen by the above that the decrease in amount in sight Oct. 29, as compared with last year, is 54,447 bales, the decrease as compared with 1884 is 38,691 bales and the decrease from 1883 is 166,347 bales."

Trunk Lines Executive Committee.

A meeting was held in New York, Nov. 3, at which Commissioner Blanchard, of the Central Traffic Association, was also present. The Committee passed resolutions to work in harmony with the Central Association, and more particularly in relation to the restoration and maintenance of rates, and to take all steps possible at this end of the line to sustain the resolutions on this subject adopted at the recent meetings at Chicago.

Coal.

Coal tonnages for the week ending Oct. 23 are reported as follows:

	1886.	1885.	Inc or Dec.	P. c.
Anthracite	786,132	795,880	D.	9,748	1.2
Eastern bituminous	208,776	244,977	I.	23,770	9.7
Coke	72,907	54,151	I.	18,806	34.7

The anthracite market is reported good, with a demand for all sizes. An increase in Western shipments is reported by all the companies.

Pennsylvania Railroad coal tonnage for the week ending Oct. 23 was:

	Coal.	Coke.	Total.	1885.
Line of road	157,766	72,288	230,054	198,752
From other lines	69,115	669	69,784	97,417
Total	224,881	72,957	297,838	296,169
Year to Oct. 23	9,287,429	2,770,314	12,057,743	11,119,220

Increase for the week, 1,669 tons, or 0.5 per cent.; increase for the year, 938,523 tons, or 8.4 per cent.

Cumberland coal shipments for the week ending Oct. 23 were 67,282 tons. Total to Oct. 23 this year, 1,967,267; last year, 2,243,459; decrease, 276,192 tons, or 12.3 per cent.

Actual tonnage passing over the Huntingdon & Broad Top Mountain road for the ten months to Oct. 30 was:

	1886.	1885.	Inc. or Dec.	P. c.
Broad Top coal	313,884	133,562	I.	180,322	135.0
Cumberland coal	235,469	383,514	D.	148,045	38.6
Total	549,353	517,076	I.	32,277	6.2

The Broad Top coal is mined on the line; the Cumberland is carried through to Huntingdon for the Pennsylvania Railroad.

Chicago Shipments Eastward.

The Board of Trade reports east-bound shipments from Chicago for the week ending Oct. 30 as follows, in tons:

	Tons.	P.c.		Tons.	P.c.
Chi. & Gd. Trunk	5,237	11.3	Pitts., Ft. W. & C.	6,515	13.9
Vich. Central	6,851	14.7	Chi., St. L. & Pitts.	9,452	20.2
Lake Shore	7,816	16.7	Balt. & Ohio	2,129	4.6
N. Y., Chi & St. L.	4,944	10.7	C. I. & I., St. L. & C.	3,704	7.9

The statement includes local as well as through shipments. The total for the week was 46,688 tons.

Shipments for six weeks past by these reports have been, in tons:

Week ending					
Sept. 25.	Oct. 2.	Oct. 9.	Oct. 16.	Oct. 22.	Oct. 30.
36,023	36,122	43,556	41,347	45,820	46,688

Shipments by the Chicago & Atlantic road are not included above.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior region from the opening of navigation up to Oct. 27 are reported by the Marquette *Mining Journal* as follows:

	1886.	1885	Inc or Dec	P. c.
Marquette Dis., L'Anse	...	20,027	D.	20,027	100.0
Mar. Dis., Munising	779,733	691,498	I.	88,235	12.7
Mar. Dis., St. Ignace	68,081	86,934	D.	18,853	21.7
Mar. Dis., Escanaba	565,273	475,770	I.	89,503	18.8
Menominee Dis., Escanaba	774,747	632,652	I.	142,095	20.8
Gogebic Dis., Ashland	655,294	506,450	I.	506,844	666.9
Ver. Dis., Two Harbors	279,941	208,712	I.	71,229	34.1
Total	3,121,069	2,202,043	I.	919,026	41.8

The total shipments from the Marquette District this year were 1,413,087 tons. The total shipments from the port of Escanaba were 1,340,020 tons. L'Anse is not a shipping port this year.

Pig-iron shipments this year have been: Marquette, 7,185; St. Ignace, 12,452; total, 19,637 tons.

Buffalo Grain Traffic.

Receipts of flour and grain by lake at Buffalo from the opening of navigation to Oct. 31 have been as follows for four years past, flour in barrels and grain in bushels, flour being reduced to grain in the totals:

	1886	1885.	1884.	1883.
Flour	3,647,726	2,174,218	2,694,781	1,783,163
Grain	63,856,668	43,797,668	48,518,815	59,093,669
Total, bushels	82,245,288	54,669,668	58,989,740	68,009,484

The total increase this year over last was 27,575,620 bushels, or 50.4 per cent. As in all the statements of this season, the large increase in flour receipts is notable.

Shipments eastward of grain received by lake for the same period were in bushels:

	1886	1885.	1884.	1883.
By canal	41,381,831	28,607,644	33,785,368	39,210,012
By rail	17,398,543	9,504,693	9,486,650	13,439,552
Total	58,780,374	37,812,304	43,272,018	52,649,564
Per cent. by rail	29.6	25.1	21.9	25.5

The canal opened May 1 this year; May 11 last year; May 7 in 1884 and May 7 in 1883. The railroads took a larger proportion of the shipments this year than in any year since 1882.

A New Uniform Bill of Lading.

The Middle & Western States Association has adopted a new form for a uniform bill of lading, which all lines in the Association are expected to adopt on Jan. 1 next. The form is as follows:

.....Station.. .....188..

Received from.....

By the.....Company,

in apparent good order, except as noted, the packages described below (contents and value unknown) marked and consigned as indicated, which said company agrees to trans

port, with as reasonable dispatch as its general business will permit, to destination, if on its road or otherwise to the place on its road where same is to be delivered to any connecting carrier, and there deliver to the consignee or such connecting carrier, upon the following terms and conditions, which are hereby agreed to by the shipper, and by him accepted as just and reasonable, and which are for the benefit of every carrier over whose line said goods are transported :

1. Neither this company nor any other carrier receiving said property to carry on its route to destination, is bound to carry the same by any particular train or in time for any particular market, and any carrier in forwarding said property from the point where it leaves its line is to be held as a forwarder only.

2. Neither this company nor any such other carrier shall be liable for any loss of or damage to said property by dangers or accidents incident to railroad transportation, or by fires or floods while at depots, stations, yards, landings, warehouses or in transit. And said property is to be carried at owner's risk of leakage, breakage, chafing loss in weight or loss or damage caused by changes in weather, or by heat, frost, wet or decay, and if any portion of its route to destination is by water, of all dangers incident to navigation.

3. Responsibility of any carrier shall cease as soon as said property is ready for delivery to next carrier or consignee, and each carrier shall be liable only for loss or damage occurring on its own line ; and in case of loss of or damage to such property for which any carrier shall be responsible, its value or cost at time and place of shipment shall govern settlement therefore, unless a value has been agreed upon with shipper, or is determined by the classification upon which the rate is based, in which case the value so fixed by agreement or classification shall govern. And any carrier liable on account of loss of or damage to such property shall have the benefit of any insurance effected thereon by or on account of the owner or consignee thereof.

4. Such property shall be subject to necessary cooperage and baling at owner's cost. And if the owner or consignee is to unload said property the delivering carrier may make a reasonable charge per day for the detention of any car after the same has been held 24 hours for unloading, and may add such charge to the freight due and hold said property subject to a lien therefor.

5. Grain in bulk consigned to a point where there is an elevator may (unless otherwise expressly noted herein, and then if it is not promptly unloaded) be there delivered and mixed with other grain of the same kind and grade, without respect to ownership, and if so delivered shall be subject to elevator charges in addition to the charges for transportation.

6. Any carrier over whose route cotton is to be transported hereunder shall have the privilege, at its own cost, of compressing the same for greater convenience in handling and forwarding, and shall not be held responsible for unavoidable delays in procuring such compression.

7. Property to be delivered at any switch or flag station where the carrier has no agent shall be at the owner's risk from the time it is ready for delivery.

8. No carrier hereunder shall be liable on account of the wrong carriage or delivery of property marked with initials or by numbers only, or otherwise incorrectly or illegibly marked.

9. Owner or consignee shall pay at the rate below stated freight charges before delivery and according to weights as ascertained by either carrier.

10. Any claim for total loss of property received hereunder shall be presented, together with this contract, within ten days from date hereof, and any claim for partial loss of any such property or damage thereto shall be presented within twenty-fours after delivery of said property to consignee, and the omission to so present such claim, either for loss or damage, shall be a waiver thereof, and no action shall be brought against any carrier for any alleged liability hereunder after one year from the date thereof.

This company guarantees the through rate of freight named below :

Rate.....To.....Per.....

MARKS AND CONSIGNEE.	ARTICLES.	Weight, subject to correction.

Traffic Notes.

The express war continues, and express rates have been reduced gradually from $2.50 to 75 cents per 100 lbs. from New York to Chicago. It is thought that the latest cut will force a settlement.

The Pacific Mail Steamship Co. and the Panama Railroad Co. have appointed a joint committee to settle their differences and also to consider the general situation of transcontinental business.

RAILROAD LAW.

Iowa Railroad Law.

In Des Moines, Ia., Oct. 25, the Iowa Supreme Court began the hearing of arguments on the so-called Sweeney law, which relates to corporations of other states doing business in Iowa. Counsel for the corporations asked for a continuance till the December term on the ground that the printed argument of the attorneys for the state raises points of law and fact which they are not prepared to discuss. The Attorney General signified his readiness to proceed, but assented to the continuance, so the oral arguments will be heard on Thursday, Dec. 9. Following is a synopsis of the points and authorities of the printed arguments :

The railroad companies, on behalf of the defendants, claim that the law is in violation of the Constitution of the United States. 1. In that it impairs the obligation of the contract between the railroad company and the state; that under the law as it existed when these foreign railroad companies leased and subsequently purchased the lines of Iowa railways there was no such burden, and the foreign corporation had the right to remove cases against them to the United States courts; that the laws of the state at that time provided for such lease and sale on part of the domestic corporation to foreign corporations having connecting railroads, and that the law as then in force entered into and became a part of the contract of lease or purchase, that to now impose this additional burden is an impairment of the obligation of such contract.

2. That the law is in further violation of the Constitution of the United States in that it amounts to a regulation of commerce among the several states. In other words, it is a regulation of interstate commerce.

3. That it is repugnant to the fourteenth amendment to the Constitution of the United States.

4. That it is unconstitutional in that it is an attempt to interfere with the jurisdiction of the Federal courts as established by the Constitution of the United States and the laws of Congress.

The Attorney General, in his argument claims: 1. That the law is a valid exercise of the police power of the state. That the state, except as limited by the United States Constitution, possesses all the powers of the most absolute government in the world.

2. That there is no contract between the state and the railroad companies. That there never has been any law in Iowa giving authority to a foreign corporation to purchase or lease an Iowa railroad. That section 1275 of the code relied on by the railroad companies only authorizes a consolidation and that if consolidated then the railroad company, as to that part of the road in Iowa, remains an Iowa corporation, and could not in any event remove cases against it wherein citizens of Iowa were parties to the United States courts.

He claims that section 1,300 of the code, which is also relied on by the railroad companies, only applies to Iowa corporations having lines of railroad connecting within the state, and has no reference at all to foreign countries. That in the absence of any law authorizing any such sale or lease, the railroad company is in the state simply by comity, and may be prohibited from further right to do business therein at the pleasure of the state, or subjected to such conditions as the Legislature may see fit to impose, not inconsistent with the Constitution of the United States. That there is no element of contract in the case. He further contends that even if the laws referred to did authorize the sale or lease, still it was a simple license, and that as such is revocable at the pleasure of the state. That in no event was there any contract on part of the state. That under the law as it existed prior to the lease or sale to these foreign corporations the state had the reserved right to alter or amend the charters of the home companies at will, and that the lessee or grantee can take no greater right than was possessed by the grantor, and so takes the property subject to this reserved right of control.

He contends that there is no element of commercial interference at all, and relies upon the last quoted cases and many other cases familiar to the profession. He went on at length to draw a distinction between commerce as transacted upon the waters bordering on the states and inland rivers on the one hand and commerce as transacted on artificial highways constructed under the authority of the various states upon the other, and showed wherein the Supreme Court of the United States had made this distinction. He cited from numerous authorities to show that the fourteenth amendment to the Constitution of the United States does not apply to corporations as citizens, and that inasmuch as the state has the absolute right to dictate the terms on which foreign corporations may do business within its jurisdiction no provision of the Constitution was violated by the Legislature in this case.

OLD AND NEW ROADS

Allegheny Valley.—In the United States Circuit Court in Pittsburgh, Oct. 29, George R. Hill and others, holders of income bonds, filed a petition asking for the removal of Mr. John Scott, one of the receivers of this road. The petition sets forth that Scott is adverse to the interests of complainants, and also that he is physically incapable of attending to the duties of the position. The Court set Nov. 13 for a hearing of the petition.

Arizona.—Track on this road is reported laid from Tucson, Ari., on the Southern Pacific road, northward 15 miles, and work is still progressing. It is a narrow-gauge line.

Atchison, Topeka & Santa Fe.—The statement for September and the nine months to Sept. 30 is as follows :

	September.		Nine months.	
	1886.	1885.	1886.	1885.
Miles worked..	2,418	2,396	2,417	2,379
Earnings.... ..	$1,466,246	$1,385,585	$11,052,675	$11,038,534
Expenses.....	669 985	635,529	5,947.595	6,002,889
Net earn....	$796,261	$750,056	$5,105,080	$5,035,645

For the nine months the gross earnings increased $14,141, or 0.1 per cent., and the expenses decreased $55,294, or 0.9 per cent., the result being a gain of $69,435, or 1.4 per cent., in the net earnings.

Atlanta & Hawkinsville.—Surveys have been begun for this projected line from Atlanta, Ga., southeast to Hawkinsville. The object of the road is to give Atlanta a new connection with some point where it can secure water connection with the coast.

Atlantic & Pacific.—A circular of the St. Louis & San Francisco Railway directors to their stockholders requests their assent to the guarantee by that company of the interest on the bonds of the Atlantic & Pacific, as follows :

"The agreement made under date of Oct. 5, 1886, between the Atlantic & Pacific, the Atchison and the St. Louis and San Francisco companies has been authorized by the directors of the three companies. This agreement proposes that the Atlantic & Pacific Co. shall issue its 4 per cent. 50-year bonds to be used in exchange, bond for bond, for its present 6 per cent. bonds, the principal and interest of such new 4 per cent. bonds to be guaranteed by indorsement by the Atchison and the San Francisco companies *severally, but not jointly, one-half by each.* The 6 per cent. bonds will be deposited as received with the Mercantile Trust Co., of New York, Trustee, to be held by it as security for the payment of the principal and interest of the guaranteed 4 per cent. bonds."

Augusta & Chattanooga.—A contract for grading this road from Augusta, Ga., west by north to Gainesville, about 130 miles, has been let to W. B. Lowe & Co., of Atlanta, Ga., who are to begin work at once. It is stated that the contracts for the grading from Gainesville to Chattanooga will be let at an early date. The whole length of the line from Augusta to Chattanooga, Tenn., will be about 200 miles.

Baltimore & Harrisburg.—At a meeting held in Baltimore last week an agreement for the lease of this road to the Western Maryland Co. was finally completed, the contract entered into in July last being then finally ratified. The Baltimore & Harrisburg Co., as already noted, is formed by the consolidation of the Hanover Junction, Hanover & Gettysburg, the Bachman Valley and the Baltimore & Hanover companies, including about 67 miles of railroad in all, extending from a junction with the Western Maryland to Hanover and Gettysburg, Pa., with several short branches. The agreement for the consolidation and transfer of these roads provided that 90 per cent. of the stock, which was held by the local owners, should be purchased at 200. The total amount of the stock being 116,875, the amount required for the purchase was $233,750. As the Western Maryland Co. had no money available for this purchase, it was agreed that the consolidated Baltimore & Harrisburg Co. should execute a mortgage to cover an issue of $690,000 in 5 per cent. bonds, of which $415,000 are to be retained by the trustees to take up the bonds of the several lines composing the new company, and the remaining $275,000 were to be sold for the purpose of providing funds for the purchase of the stock. These bonds have been sold to several bankers in Baltimore at 91½, yielding a surplus over the amount required. Under this agreement the Western Maryland Co. will be not only lessee but practically owner of the Baltimore & Harrisburg Co., subject, of course, to the lien of the bondholders. The leased road, however, has always been a profitable property, and will, without doubt, be able to earn the charges on the new bonds, while the exclusive control of its traffic, a portion of which has heretofore gone to other lines, will be of importance to the Western Maryland.

Boston & Lowell.—A special meeting was held in Boston, Oct. 30, to vote on the ratification of the proposed lease of the Massachusetts Central road. After the lease was read, it was voted that the polls should be kept open until Saturday, Nov. 6, in order that all the stockholders might have an opportunity to record their votes.

Boston & Providence.—The Boston *Advertiser* says "The folly of much of the talk concerning a proposed consolidation of the lines connecting this city with New York is shown in a statement recently made to a prominent official of the Boston & Providence road by a New York *Herald* reporter, who had been sent East to look up the matter. The remark was to the effect that a controlling interest in the stock of that road had been purchased by representatives of the Boston & Albany and the New York & New England, and that the proposed consolidation of those two roads involved the absorption of the Boston & Providence. The official was solemnly assured that such was the fact, but as his position afforded him the very best means of information upon the subject, and as no such wholesale transfer of stock had been made, the solemn assurance of the New York man afforded him no little astonishment as well as amusement."

Buffalo, New York & Philadelphia.—The following statement is published for the year ending Sept. 30 :

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Earnings	$2,598,569	$2,367,937	I. $230,632	9.7
Expenses...	2,048,842	1,764.447	I 284 395	16.1
Net earnings... ..	$549,727	$603,490	D. $53,763	8 9

The large increase in expenditures was caused by the addition of 300 cars, five engines and the rebuilding of 22 new stations, new steel, new sidings and right of way. The item of extraordinary expenses foots up $206,821 for last year.

Burlington, Cedar Rapids & Northern.—The Sioux Falls Branch was on Oct. 26 completed to Sioux Falls Dak., 42½ miles from the junction with the Watertown line at Ellsworth, Minn. Trains have already begun running to the new terminus.

California Pacific.—This company gives notice that it has resolved to extend its $2,250,000 mortgage bonds, which will mature on Jan. 1 next, for 25 years at 4½ per cent. interest. Holders who wish to avail themselves of the privilege of extension are requested to present their bonds to Speyer & Co., New York, as soon as possible. The bonds now bear 7 per cent. interest. The California Pacific road owns part of the Central Pacific system and is leased to the Southern Pacific Co. with the rest of that system.

Canadian Railroad Commission.—The Railroad Commission, which was appointed to inquire into railroad concerns in Canada and report on grievances and the necessity of appointing a permanent commission, met in Toronto last week. It was shown in evidence that the Grand Trunk Railway had for many years failed to comply with the statutes providing for the rate it should charge. The act, it was stated, provides that the company shall charge not more than 2d. per mile for first class, 1½d. for second class and 1d. per mile for third class. The road has never had third-class cars except for one year after it was opened in 1856, and it is estimated that on the line between Toronto and Montreal alone this road has by charging in excess of the rates provided in its charter netted $42,000 a year. It is proposed to appoint a permanent commission, taxing the companies operating in Canada a certain amount per mile per annum to support it.

Carthage & Adirondack.—Track is laid and the road has been opened for business from Carthage, N. Y., on the Utica & Black River road, eastward to Jayville, a distance of 30 miles. The road extends into the Adirondack region from the west. The stations, with the distances from Carthage, are : Clearwater, 7 ; Natural Bridge, 10 ; Diana, 16 ; Lake Bonaparte, 18 ; Harrisville, 21 ; Jayville, 30 miles.

Chatham & Harwich.—Surveys have been made for this projected road, which is to run from Chatham, Mass., to Harwich, on the Old Colony road, and the location has been submitted to the Railroad Commissioners for approval.

Chesapeake & Ohio.—At a meeting of the board held Oct. 26 the following statement was presented for the six months from May 1 to Oct. 31:

Net earnings, October estimated.....		$681,408
Interest on funded debt.....	$189,630	
Equipment trust bonds paid and interest.....	104,910	
Taxes and miscellaneous.	103,345	
Construction account.....	67,746	
		465,631
Surplus for interest on Series B bonds		$215,777

On this exhibit the directors resolved that the result of the operations of the road would justify the payment in cash of one-half of the coupons maturing Nov. 1 on the Series B bonds of the company and that interest certificates in the usual form should be issued for the remaining half of the coupons. Notice is also published that on those bonds of this series which have been presented by holders and extended at 4 per cent., according to the offer made by the company some time ago, the full amount of the coupons of 2 per cent. due Nov. 1 will be paid.

Holders of the currency bonds of 1918 are notified that the Newport News & Mississippi Valley Co., is now prepared to issue its certificates of stock in exchange for their bonds, as offered in the circular of July 24 last.

Chicago Air Line.—This company has filed articles of incorporation in Indiana to build a railroad from Toledo, O., to Chicago by the shortest practical line. The distance is about 250 miles, of which 220 miles will be in Indiana.

Chicago, Burlington & Northern.—Through passenger trains between Chicago and St. Paul commenced to run over this road on Nov. 1. Two express trains are to run daily in each direction.

The grading is nearly completed on the branch extending from the main line into the city of Galena, Ill., and tracklaying will shortly be begun.

Chicago & Northwestern.—This company has let a contract to Harrison & Green, of Milwaukee, for the grading of an extension of the Iron River Branch, from Iron River, Mich., to Watersmeet, on the Milwaukee, Lake Shore & Western road, a distance of 37 miles. The contract calls for the completion of the work by July 1, 1887. The contract will require some very heavy work, including a good deal of rock cutting. The line, it is said, will be extended to the Gogebic iron range.

Tracklaying is now completed on the extension of the Lake City Branch from Lake City, Ia., westward to Wall Lake, 13½ miles.

Chicago, Rock Island & Pacific.—On the extension this company's line into Kansas track is laid from St.

Joseph, Mo., west to Troy, Kan., 15 miles, and tracklaying has also been begun from Topeka eastward. On the northwestern extension, which is to leave the Topeka line at Horton, 40 miles from St. Joseph, much work has been done on the grading, and tracklaying will soon be begun.

Cincinnati & Eastern.—It will be remembered that this road was purchased at the recent foreclosure sale by Albert Netter, of Cincinnati, who was understood to represent Eastern parties. Mr. Netter paid down $25,000 at the time of the sale, but a Cincinnati dispatch states that he has defaulted on the second payment of $60,000, which was due Oct. 28. Mr. Netter gives as a reason for this default a disagreement among the purchasers.

Clearfield & Jefferson.—This road is now completed to Mebaffey, Pa., 19 miles westward from Irvona, Pa., the terminus of the Bell's Gap road. The road is an extension of the Bell's Gap Railroad, and work is progressing on the line to Punxsutawney, where it will connect with the Rochester & Pittsburgh road.

Columbus & Florida.—Surveys have been begun for this projected line, which is intended to be an extension of the Georgia Midland & Gulf road, from Columbus, Ga., southward. The first section proposed, and for which the line is to be located, is from Columbus, southeast to Albany, about 80 miles. From Albany the line will be run nearly due south to Tallahassee, Fla. It is stated that another line will be surveyed from Tallahassee somewhat more direct than the one by way of Albany.

Columbus & Western.—A contract has been let for grading 27 miles of the extension of this road from the present terminus at Goodwater, Ala., to Birmingham. Other contracts will be let shortly. The intention is to have the road running to Birmingham by July of next year.

Dayton & Ironton.—The statement for August and the eight months to Aug. 31 is as follows:

	August.	Eight months.
Earnings	$20,447	$141,923
Expenses	16,486	146,698
Net or deficit N.	$3,961	D. $4,775
Fixed charges	1,788	15,321
Surplus or deficit S.	$2,173	D. $20,096

As compared with last year, the month of August shows a decrease of $1,080, or 5.0 per cent., in gross earnings and of $2,310, or 36.7 per cent., in net earnings. No comparison is made for the eight months.

Delaware & Hudson Canal Co.—H. G. Young, Assistant President and General Manager, issued the following circular on Oct. 20, 1886: "On Saturday midnight, Nov. 6, proximo, this company will assume possession and management of the Union Railroad, extending from Green Ridge (Scranton) to Wilkes-Barre, Pa., which has heretofore been operated under lease by the Lehigh & Susquehanna Railroad Co. This line will form a part of the Pennsylvania Division."

Detroit, Mackinac & Marquette.—The notice which was published last week concerning the plan of reorganization of this company was based on a plan formed some time ago, which has since been materially changed. The plan as at present proposed by the syndicate which purchased the road at foreclosure sale, and which has been agreed to by some of the holders of the securities of the old company, is as follows: The road is to be transferred to the Duluth, South Shore & Atlantic Co., a corporation whose organization and purposes were noted last week. The Detroit, Mackinac & Marquette first-mortgage bondholders are to receive Duluth, South Shore & Atlantic first-mortgage 5s to the amount of the old bonds, and also preferred stock to the par value of the bonds. Income coupons are to be exchanged at par for preferred stock in the new company. Land grant bonds are to receive 35 per cent. of their face value in common stock of the new company, and the holders are also to retain their lien upon the land grant. The old common stock will receive 60 per cent. of its face value in stock of the new company.

Duluth, South Shore & Atlantic.—It is announced that this company, which bought the Detroit, Mackinac & Marquette road at foreclosure sale, has also bought from the Boston holders a controlling interest in the Marquette, Houghton & Ontonagon road. This road extends from Marquette to Houghton, with numerous short branches to iron mines, and has a large business, varying, of course, with the fluctuations of the iron trade. It has been heretofore owned almost entirely in Boston. The particulars of the sale are noted elsewhere.

Fort Worth & Denver City.—On the extension of this road track is now completed to Vernon, Tex., 16 miles northwest from the late terminus at Harrold and 163 miles from Ft. Worth. Work is progressing actively on the extension of the line.

Fort Worth & Rio Grande.—The people of Fort Worth, Tex., have completed a subscription of $40,000 in aid of this projected road, and smaller subscriptions have been raised at other points along the line. The company has decided to begin work at once on the survey of the road from Fort Worth southwest to Brownwood, on the Gulf, Colorado & Santa Fe road.

Georgia Midland & Gulf.—The bridge over Bull Creek, 12 miles from Columbus, Ga., is completed, and trains have crossed it. The trestle at Willis Creek is nearly completed; when it is finished the track can be laid for a long distance without interruption from bridges. At Flint River the piers are now up far enough to prevent interruption to the work by high water.

Grand Rapids & Indiana.—The statement for September and the nine months to Sept. 30 is as follows:

	September.		Nine months	
	1886.	1885	1886.	1885.
Earnings	$191,597	$190,517	$1,480,967	$1,405,843
Expenses	115,420	113,794	968,719	997,699
Net earnings	$76,177	$76,723	$512,248	$408,144

For the nine months the gross earnings increased $75,124, or 5.3 per cent., and the expenses decreased $28,980, or 2.9 per cent., the result being a gain of $104,104, or 25.5 per cent., in the net earnings.

Hanover Branch.—At the annual meeting of this short Massachusetts line last week it was stated that the road had done exceedingly well during the year ending Sept. 30, having paid 6 per cent. dividends on its stock and reduced its debt by $5,000.

Huntington & Broad Top Mountain.—It is said that negotiations are in progress for a lease of this road to the Pennsylvania Railroad Co. The main line of the Broad Top road connects the Pennsylvania Railroad with its Bedford Division, extending to the Cumberland coal fields, and the road has for years carried a heavy coal traffic for the Pennsylvania Railroad under a traffic contract. It has also delivered to the Pennsylvania Railroad the business of the Broad Top coal mines along its own line. A lease would make very little difference in the relations of the companies.

Indiana, Bloomington & Western.—A circular issued by this company to the bondholders, after referring to the Cincinnati, Sandusky & Cleveland lease, says: "Under these circumstances it becomes the duty of the management to advise you that, in any event, it has become necessary to reorganize the company by means of foreclosure and sale, and the organization of a new company which will be free from the obligations of the lease, and capable of negotiating for itself upon an independent basis. Through the prompt co-operation of the company and all bondholders, this purpose can be speedily accomplished, and prompt and regular interest payments renewed and permanently continued. Numerous holders of large amounts of our several issues of bonds have been in consultation, and have advised the adoption of a plan of reorganization which will fully preserve the status of all the interest-bearing securities; secure beyond question the prompt payment of interest at a fixed rate, and at the same time protect the holders of incomes and stock. A meeting of bondholders will be convened within a short time, with the view of appointing a suitable committee to represent your interests, and after due consideration, to submit for your approval a plan of reorganization. In the mean time you are earnestly cautioned against being disturbed on account of the apparent complication of the company's affairs, and are assured that in the best opinion of your board your securities are abundantly good, and that, with your prompt co-operation, the suspension of interest payments will be merely temporary.

"I am pleased to add for your information that at a recent conference with the representatives of the Cincinnati, Sandusky & Cleveland Co., a basis for adjustment was practically agreed upon, looking to a consolidation of the entire system, which seems to your board fair, just and equitable, and one that will tend to the permanent advantage of all classes of security-holders. Your approval of this adjustment and the reorganization will, however, be necessary to its consummation."

Kansas City, Indian Territory & Louisiana.—This company has filed articles of incorporation in Kansas to build a railroad from Kansas City to El Dorado, and thence southward, across the Indian Territory, to Shreveport, La. A branch to Arkansas City is also proposed, the total length of the projected line being about 700 miles.

Kansas, Colorado & Texas.—This company has filed articles of incorporation to build a railroad from Lakin, in Finney County, Kan., to the southern line of the state, and thence across the Indian Territory, to a point on the Canadian River in Texas. The articles also provide for a branch to Trinidad, Colorado.

Kentucky & Indiana Bridge Co.—Track has been laid across the new bridge of this company between Louisville, Ky., and New Albany, Ind., and the bridge company is running independent trains between these two cities, a distance of 5¾ miles, leaving each terminus every hour. The track owned by the bridge company is about 3 miles in length.

Keokuk & Western.—This company, which recently filed articles of incorporation in Iowa, is organized by the bondholders who bought the Missouri, Iowa & Nebraska road at foreclosure sale. The road, which was recently part of the Wabash system, extends from Keokuk, Ia., to Humeston, a distance of 131 miles.

Little Rock, Mississippi River & Texas.—An extended report and plan of reorganization has been issued which proposes that the property should be divided and two distinct corporations organized—one to own the road between Little Rock, Ark., and Arkansas City, 120 miles, known as the Pine Bluff Division, the other to own the Ouachita Division from Trippe, 7 miles west of Arkansas City, to Texarkana, Texas, of which 49 miles are built.

The reorganization plan is substantially as follows: The capital stock of the Pine Bluff Co. (preferred), subject to increase or decrease, will be $1,326,106; the common stock will be $1,673,894; $2,500,000 new first-mortgage gold bonds will be issued and used in this wise: $1,608,200 to pay the present first-mortgage bondholders 85 per cent. of their holdings, $1,892,000; $1,500,000 to pay secured debts; and the balance, $391,800, will be retained in the treasury for steel rails, repairs, improvements, and to pay dissenting bondholders, if necessary, their distributive share of the proceeds of the sale not paid by stockholders. The preferred stock, $1,326,106, will be used to pay 15 per cent. of the $1,892,000 of the present first-mortgage bonds; $992,306 of the principal to take care of the overdue coupons, and the balance of $50,000 to secured creditors. The common stock, $1,673,894, is to be issued ratably to the second-mortgage bondholders, $1,106,060 being taken for the principal, $482,750 for the unpaid coupons, and $85,144 for excess for distribution. Of the $3,000,000 stock which is to be issued by the new Ouachita Co. on the road from Trippe westward, $1,000,000 will be issued to stockholders in the present company who agree to the plan and pay an assessment of 2 per cent.; $50,000 will go to secured creditors, and the balance of $1,950,000 will be retained to provide for the extension of the road.

Litchfield, Carrollton & Western.—Track on this road is now completed from Litchfield, Ill., west to Carlinville, 16 miles. Work is progressing rapidly and the line from Carlinville to Greenfield, 22 miles, will be completed by Jan. 1. The road will be operated by the Jacksonville & Southeastern Co., with whose line it connects at Litchfield.

Longdale Iron Co.—This company has completed a narrow-gauge road from Sewell, W. Va., on the Chesapeake & Ohio road, up Mann Creek to the Tyree coal mine, a distance of 8½ miles.

Maine Central.—It is reported that this company is negotiating for a lease of the Portland & Ogdensburg road, although no definite proposition has been made, but it is stated that a majority of the board is in favor of the lease.

Mammoth Cave.—We have received an invitation to the opening of this new road, which reads as follows; it is signed by John F. Wheless, President:

"The completion of a railroad to the Mammoth Cave, the grandest of American wonders, is a matter of national interest, and offers a fitting opportunity for inviting distinguished representatives from each of the states to be present on the occasion of its formal opening on Nov. 17. I am therefore authorized to extend to you a cordial invitation to be present. Believing that such meetings will exert a salutary influence toward promoting fraternal feelings between the different sections of our country, we feel that they should be encouraged, and in this instance it should prove especially pleasant, for aside from the distinguished company that will be present, a visit to this great masterpiece of Nature's handiwork will be full of interest."

Marietta, Columbus & Northern.—This name has been adopted by the line formerly known as the Marietta Mineral road. The road extends from Marietta, O., to Amesville, 30 miles, a greater part of it being on the old line of the Marietta & Cincinnati road, which was abandoned several years ago.

Marietta & North Georgia.—In October, 1885, the Legislature of Georgia passed resolutions providing that the bonds of this company held by the state will be surrendered, provided the road was completed to the North Carolina line within twenty months. The road has been completed and inspected, but before the bonds could be turned over a temporary injunction was served on the State Treasurer forbidding the surrender of the bonds. The Governor of Georgia has issued a proclamation, announcing the completion of the road within the required time, and directing that the bonds be surrendered, as provided by the Legislature, so soon as the injunction shall be dissolved, the company to execute the proper releases.

Marquette, Houghton & Ontonagon.—On Nov. 1 the directors of this company issued the following circular to the stockholders:

"A communication from Messrs. Lee, Higginson & Co. has been received, stating that they have bought recently, on behalf of the owners of the Duluth, South Shore & Atlantic Railroad, a sufficient number of shares, common and preferred, in the Marquette, Houghton & Ontonagon Railroad Co., to give to that syndicate practical control, and offering in their behalf to purchase the remainder of the stock, or any part of the same, at $110 for the preferred, and $40 for the common stock, buyer 60, the purchase to carry interest, and the offer to hold good for 30 days from Oct. 30. The offer is made conditional upon turning over to the purchasers, within 60 days, or whenever the buyer 60 shares are paid for, the direction of the company, and its executive offices.

"The undersigned recommend to the stockholders the acceptance of this offer.

"Messrs. Lee, Higginson & Co., 44 State street, Boston, will receipt for the stock as it shall be delivered to them by stockholders prior to Nov. 30."

Massachusetts Central.—A special meeting was held in Boston, Oct. 30, to vote on the proposed lease of the road to the Boston & Lowell Co. The lease was read and after a short discussion the polls were opened, and it was resolved that they should be kept open until Saturday, Nov. 6, all stockholders to be given in this manner an opportunity to record their votes.

By the terms of the lease it is to continue for 99 years, the lessee guaranteeing the fixed charges; the rental to be 20 per cent. of the gross receipts, up to $1,000,000 a year, any deficiency required to meet interest being made up by the lessee and any excess over interest to be paid over to the lessor company. Should the gross receipts exceed $1,000,000 in any one year, the rental is to be 25 per cent. The Central Massachusetts agrees to issue $2,000,000 in first-mortgage 5 per cent. bonds with which to cancel the outstanding certificates of indebtedness, to pay off current liabilities and land damages and to complete the road from its present terminus at Jefferson, Mass., to Northampton.

The Boston & Lowell Co. agrees to place the uncompleted portion of the road under contract at once, and also to build a branch from Palmer to Holyoke. Should the issue of bonds be insufficient to pay the cost of the main line and the branch also, the lessee may call for additional bonds, the Railroad Commissioners to determine the amount to be issued. The Boston & Lowell Co. also agrees that in computing the gross earnings of the leased road no charge shall be made for the use of its track from North Cambridge to Boston, or for the terminal facilities in Boston, and it also agrees to pay $1,500 a year to maintain the organization of the lessor company.

Memphis & Charleston.—The statement for September and the three months of the fiscal year from July 1 to Sept. 30 is as follows:

	September.		Three months.	
	1886.	1885.	1886.	1885.
Earnings	$120,680	$105,195	$335,578	$284,835
Expenses	67,745	77,451	215 810	210,071
Net earnings	$52,935	$27,744	$119,708	$74,764

For the three months the gross earnings increased $850,683, or 17.8 per cent., and the expenses $5,739, or 1.7 per cent., leaving a gain of $44,944, or 60.1 per cent., in the net earnings.

Mexican Central.—The statement for September and the nine months to Sept. 30 is as follows:

	September.		Nine months.	
	1886.	1885.	1886.	1885.
Earnings	$300,876	$238,704	$2,610,769	$2,650,497
Expenses	190.462	152,901	1,846,635	1,526,399
Net earnings	$110,414	$85,893	$844,134	$1,124,098

These earnings are in Mexican currency. For the nine months the gross earnings increased $40,272, or 1.5 per cent., and the expenses $320,236, or 20.9 per cent., the result being a decrease of $279,964, or 24.9 per cent., in the net earnings.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Oct. 23:

The state of Puebla offers a subvention of $500 per kilometer to railway companies building short lines from the city of Puebla to towns not over 12 kilometers distant.

A railway from Tulancingo to Zacualtipan is projected, and it is reported that the Governor of Hidalgo is negotiating with Mr. Frederic Boden for the construction of this road, which will open up the coal fields.

The Legislature of the state of Hidalgo has passed a law authorizing the Executive of the state to enter into contracts with one or more persons, or with a company or companies, for the construction and operation of railways within the state, and authority is given for offering a subvention of $1,500 per kilometer.

Minnesota & Northwestern.—A circular has been issued by the President, Mr. A. B. Stickney, under date of Oct. 22, which has the following: "With the month of September ended the first year of the operation of your railroad. A statement of the operation for the year, just received from the Auditor, shows the following gratifying results:

Gross earnings	$414,528
Operating expenses	282,165
Leaving net earnings	$152,362
From this deduct amount due for taxes, etc	8,954
Total	$143,408

"It requires $124,350 to pay fixed charges, leaving a surplus of $19,058 for the year."

Missouri Pacific.—This company's Kansas & Colorado line is now completed and opened for business from Salina, Kan., on the Topeka, Salina & Western, westward to Genesee, a distance of 42½ miles.

Newport News & Mississippi Valley Co.—The statement for the month of September is as follows:

	Gross earnings.		Net earnings.	
	1886.	1885.	1886.	1885.
Chesapeake & Ohio	$388.992	$309.097	$140,016	$122,042
Eliz., Lex. & Big Sandy	95,801	72,519	37,758	36,629
Ches., Ohio & Southwest.	160,943	138,892	69,823	52,556
Total	$645,736	$520,508	$247,597	$211,227

The total increase in gross earnings this year was $125,228, or 24.1 per cent.; in net earnings, $36,370, or 17.2 per cent.

New York, Susquehanna & Western.—The statement for September and the nine months to Sept. 30 is as follows:

	September.		Nine months.	
	1886.	1885.	1886.	1885.
Earnings	$10 ,8 7	$ 05.754	$799 .92	$863 519
Expenses	60,489	53,368	466,348	434,143
Net earnings	$42 328	$51.988	$332.944	$369. 76

For the nine months the gross earnings decreased $4,227, or 0.5 per cent., and the expenses increased $32,295, or 7.4 per cent., the result being a decrease of $36,432, or 9.8 per cent., in the net earnings.

Norfo k & Western.—This company's statement for September and the nine months to Sept. 30 is as follows:

	September		Nine months	
	1886.	1885.	1886.	1885.
Earnings	$319,925	$267.374	$2.3 ,299	$1 965,075
Expenses	181,370	137,008	1,392 316	1.213,53
Net earnings	$137,555	$13 .366	$919,98	$751,542
Per cent of exps	57	51	60	6

For the nine months the gross earnings increased $347,224, or 18 per cent., and the expenses $178,783, or 15 per cent., the result being a gain of $168,441, or 22 per cent., in the net earnings.

Northern Pacific.—The statement for September and the three months of the fiscal year from July 1 to Sept. 30 is as follows:

	September.		Three months	
	18 6.	1885	1886.	1885.
Earnings	$1.372 672	$1.2 4,955	$3,699,056	$3,196,257
Expenses	605.641	5 2,806	1,736 546	1,448,044
Net earnings	$7 9 031	$692,059	$1 962,510	$1.748,211
Fixed charges for the quarter			1,544,739	1,489,184
Surplus			$417,771	$2 9,027

For the three months the gross earnings increased $502,801, or 15.7 per cent., and the expenses $288,502, or 19 9 per cent., leaving a gain in net earnings of $214,299, or 12.3 per cent. Fixed charges increase $55,555, or 3.7 per cent., the result being an increase of $158,744, or 60.7 per cent., in surplus.

Land sales for this year were 58,807 acres, the total amount received, including town-lot sales, being $226,070 for the quarter.

On the great tunnel on the Cascade Division the east heading is now in 1,028 ft. The Dingle tunnel, two miles east of the great tunnel has 400 ft. through, leaving only 125 ft. to be completed. The track is now laid to Cle-elum, Wash. Ter., 30 miles westward from Edensburg, leaving only 15 miles to reach the east portal of the tunnel.

Ohio Valley.—This road has been completed and opened for business to Sturgis, Ky., 5 miles beyond the late terminus at De Koven and 44 miles from the starting point at Henderson.

Parsons & Pacific.—Track on this road is now completed from Parsons, Kan., southwest to Coffeyville, a distance of 31 miles, and trains are running over this section of the road, which is operated by the International Construction Co. The company has laid out a pretty ambitious programme. From Parsons, the road is to be extended northeast to Kansas City, while from Coffeyville three lines are projected; one running due west to the western line of Kansas, and thence west by south to Albuquerque, N. M.; the second from Coffeyville across the Indian Territory, Texas and the southern part of New Mexico to El Paso; and the third across the Indian Territory and Texas to Eagle Pass, on the Rio Grande.

Pennsylvania.—This company's statement for all lines east of Pittsburgh and Erie for September, 1886, as compared with the same month in 1885, shows: an increase in gross earnings of $397,424; an increase in expenses of $472,940; a decrease in net earnings of $75,516. The nine months of 1886 as compared with the same period of 1885 show an increase in gross earnings of $3,628,652, an increase in expenses of $1,877,791, an increase in net earnings of $1,750,861.

This gives the following statement:

	September		Nine months.	
	1886.	1885.	1886	1885
Earnings	$4 674,052	$4,276,628	$36 855,292	$33,226 640
Expenses	2 8 7,8 8	2 84,658	3 803,455	22 015,664
Net earnings	$1,816 454	$1,891 970	$12,971,837	$11.2 0,976
P. cent. of exps.	61.1	55 8	64 8	66.2

All lines west of Pittsburgh and Erie for the nine months of 1886 show a deficiency in meeting all liabilities of $261,783, being a decreased deficiency as compared with the same period of 1885 of $982,702.

At a meeting of the directors held Nov. 1, it was decided to declare a dividend of 2½ per cent. in cash, making, with the May dividend, 5 per cent. for the current year. Last year the May dividend was 3 per cent. and the November dividend 2 per cent. There has been some expectation that the dividend would be 3 per cent., although nothing has been given out by the company to justify such expectation.

Philadelphia & Reading.—The Receivers' statements give the following figures for the earnings of the railroad for September and the ten months of the fiscal year from Dec. 1 to Sept. 30:

	September.		Ten months.	
	1886.	1885.	1886	1885.
Earnings	$2 9 9,5 6	$2,800,987	$24,514 397	$23,408,752
Expenses	1,6 1,1 0	1,4 0 4 3	14,401,035	13.9 0,6 0
Net earnings	$1,328,516	$1,3 5,924	$10,113,372	$9 498,132

For the ten months the gross earnings increased $1,105,645, or 4.7 per cent., and the expenses $490,445, or 3.5 per cent., the result being a gain of $615,200, or 6.5 per cent., in the net earnings.

The traffic reported for the railroad lines is as follows:

	September.		Ten months.	
	1886.	1885.	1886	1885.
Tons coal	1,900 426	1,267 616	10,426 107	9 885,564
Tons merchandise	956, 8	855,000	8 762,212	6,783,889
Passengers	2,486 430	2,345,203	21,323,162	19,511,038
Tons coal on colliers	39,768	52,359	470,514	461,185

An increase is here shown, both for the month and the year, in all items, except the comparatively small one of coal shipments in the company's own boats.

The statement for the Philadelphia & Reading Coal & Iron Co. is as follows:

	September.		Ten months.	
	1886.	1885	1886	1885
Earnings	$1,648,814	$1 754,214	$1 ,923,730	$12,947,071
Expenses	1,791,182	1.834 485	13,979,922	12 526 892
Deficit	$142 368	$80.271	$1,756.192	$276 821

Here there was for the ten months a decrease of $23,341, or 0.2 per cent., in gross earnings; an increase of $1,453,030, or 11.6 per cent., in expenses, and an increase of $1,476,371, or 527.3 per cent., in the deficit.

The coal mined from the company's lands was as follows:

	September		Ten months.	
	18 6.	1885.	1886.	1885.
By company	571,078	553,426	4.47 .330	4,119,013
By tenants	56,771	72,794	490,441	630,153
Total	627.849	626,220	4,962,771	4.749,166

The increased deficit for the ten months was thus made in an increase of 213,605 tons, or 4.5 per cent., in the output from the company's mines.

The joint net earnings of the two companies were:

	September		Ten months	
	1886.	1885	1886.	1885.
Railroad Co., net	$1,3 8,516	$1,3 5 9 4	$10 ,13 332	$9 498,132
C. & I. Co., deficit	142,368	80,271	1,756 192	279,821
Total, both Cos.	$1,186,148	$1,2 5,653	$8,357 140	$9,218,311

The decrease in the total net earnings for the month was $39,505, or 3.2 per cent.; for the ten months, $861,171, or 9.3 per cent. As the expenses reported do not include any payments for interest or rentals, the net earnings given above are the sums from which all fixed charges are to be met.

Portland & Ogdensburg.—It is reported that negotiations are in progress for a lease of this road to the Maine Central Co. The question, it is stated, has been discussed by the directors of both companies, although no formal proposition has yet been made.

Port Royal & Western Carolina.—The Augusta & Knoxville directors have voted to approve the agreement under which this company is to be formed by the consolidation of all the Georgia Central lines in South Carolina.

The capital stock of the consolidated company will include $2,000,000 preferred and $4,000,000 in common stock, and it will, of course, assume all the debts of all companies, on terms to be arranged with the holders.

Richmond & Danville.—Tthis company has leased the Washington, Ohio & Western road, as noted more fully elsewhere. Formal possession was taken Nov. 1.

Richmond & West Point Terminal Co.—The following named gentlemen, who represent a large interest in Richmond & West Point Terminal stock, have been nominated as directors of the company, to be voted for at the ensuing election, Nov. 19: Alfred Sully, Geo. F. Stone, Emanuel Lehman, T. M Logan, John A. Rutherford, Isaac L. Rice.

St. Louis, Arkansas & Texas.—Contracts have been let for a section of 9 miles of the branch from Sherman, Tex., and the contractors have already begun work.

St. Louis & San Francisco.—On the extension of the Arkansas Division from Fort Smith, Ark., southward, track is now laid for 20 miles from Fort Smith and the grading is finished 5 miles further. At this point a tunnel nearly half a mile long is to be built through a spur of the Ozark Mountains, but the contractors are putting in a temporary line over the mountain, which will be used until the tunnel is finished.

St. Paul, Minneapolis & Manitoba.—The branch from Tintah west is now completed to Rutland, Dak., 59.10 miles from Tintah, Minn., and 33.60 miles beyond the late terminus at Hankinson. The new stations opened, with the distances from Tintah are: Stiles, 36.96; Lidgerwood, 41.56; Geneseo, 47.76; Seneca, 52.74; Rutland, 59.10 miles.

San Antonio & Aransas Pass.—The main line of this road is now completed from San Antonio, Tex., southward to Corpus Junction, 141 miles, an extension of 25 miles since the last report. The branch from Corpus Junction to Corpus Christi, 11 miles, is also completed, and the company opened its line from San Antonio to Corpus Christi, 152 miles, for traffic on Nov. 1. There remains to be completed 15 miles of the main line, from Corpus Junction to Aransas Pass.

Work is also progressing on the Northwestern Extension, from San Antonio to Kerrville, 70 miles.

San Joaquin & Sierra Nevada.—A controlling interest in this road, which was owned by Messrs. F. and C. Birdsall, has been sold to the Southern Pacific Co. The road is of 3 ft. gauge, and extends from Brack's Landing on the Mokelumne River west to Valley Spring, Cal., 40 miles. It crosses the Central Pacific at Lodi. It is understood that the Southern Pacific Co. will change the road to standard gauge and will extend it eastward into the timber belt.

Savannah, Dublin & Western.—A contract has been let to an organization known as the United States Railroad Construction Co., of New York, to build and equip this road. The contractor agrees to have the line from Savannah to Macon, Ga., 117 miles, completed within 8 months, and the branch from Dublin to Americus, 90 miles, within 14 months.

Savannah, Florida & Western.—The Passenger Department gives notice that the fast mail line to Havana over this road and by steamer from Tampa, Fla., from Nov. 1 will be run as follows: Steamers will leave Havana on Mondays, Thursdays and Saturdays, reaching Tampa on the following day; they will leave Tampa on Tuesdays, Thursdays and Saturdays, on arrival of the "West India Fast Mail," which is due at 8:45 p. m., at that station.

Securities on the New York Stock Exchange.—The following securities have been admitted to dealings by the Governing Committee:

Burlington, Cedar Rapids & Northern, an additional $334,000 of consolidated 5 per cent. bonds, making the total amount listed up to $5,000,000.

Chicago, Burlington & Northern, first mortgage 5 per cent. bonds due April 1, 1926, $9,000,000.

Chicago & Indiana Coal, an additional $434,000 first mortgage 5 per cent. bonds, making a total of $2,808,000.

Missouri, Kansas & Texas, an additional $1,000,000 6 per cent. general consolidated bonds, making total amount of 6s. and 5s. up to $32,000,000.

Richmond & Danville, assented debenture bonds, $1,000,000, exchangeable into a consolidated 5 per cent. bond at the rate of $1,180 new bond and $29.50 cash for each $1,000.

Seneca Falls & Cayuga Lake.—This company was incorporated in May last, and the road was opened in August. It is of standard gauge, and is intended for local and pleasure passenger traffic. It extends from Seneca Falls, N. Y., to Cayuga Lake Park, a distance of 4 miles. It has 2 locomotives and 4 steam passenger cars.

Sheffield & Birmingham.—We have received the following note from Mr. P. Campbell, Superintendent of the Sheffild & Birmingham Construction Co., which is building this road: "This road has been finished and is in operation from the landing on the Tennessee River, in Sheffield, Ala., to the town of Russellville, in Franklin County, a distance of about 22½ miles. The grading is completed on 4 miles more, on which the rails will be laid in November, and the contractors are pushing work on an additional section of 25 miles, which they hope to have ready for the rails in about four months."

Southern Pacific.—Work is progressing on the southern end of the new Coast line in California. The grading is completed some 15 miles from the old line at Newhall Junction, and the track is laid for 8 miles. There is some heavy work on this end of the line.

The company has bought a controlling interest in the San Joaquin & Sierra Nevada road, as noted elsewhere.

Tavares, Apopka & Gulf.—Work is progressing steadily on this road. The grading is now completed for 16 miles southward from Tavares, Fla., and track is reported laid for 10 miles.

Texas & Pacific.—At a meeting of the Reorganization Committee last week a resolution was passed requesting the Court to approve the application of the receivers for permission to issue certificates to the amount of $75,000, to pay for new locomotives, and $77,000 to pay for new cars. The Court was also asked to approve contracts made by the receivers for 30,000 tons of steel rails. The Committee also voted to pay $28,000 from the funds received from the stockholders' contribution to the receivers, accepting certificates in return.

Toledo & Ohio Central.—This company has recently completed a branch extending from Sedalia, O., to a new coal mine. The branch is 2 miles in length.

Union Pacific.—The Boulder & Caribou Branch of the Colorado Division has been extended from the late terminus at Marshall, Col., southeast 21 miles, to Argo Junction, 2½ miles from Denver. This branch is now 27 miles long, from Argo Junction to Boulder.

Venice, Marine & Western.—This company has been organized to build a railroad from Venice, Ill., on the Mississippi opposite St. Louis, thence to Marine, in Madison County, and eastward to the Indiana line.

Vermont Valley.—This company has offered to build a branch 4 miles in length to Springfield, Vt., provided the town will agree to build and keep in repair a bridge across the Connecticut River, this bridge to be used for highway traffic as well as for the railroad.

Vicksburg & Meridian.—This division of the Cincinnati, New Orleans & Texas Pacific line is having its bridges reconstructed and remodeled to carry a heavier class of locomotives, with which it will soon be equipped. Mr. M. Walsh, Inspector of Bridges on the system, informs us that there are no less than 336 numbered bridges and trestles on this division, besides numerous small openings, and considerable work will be required to place them in the condition intended by the company.

Wabash, St. Louis & Pacific.—A circular has been issued by the committee of first-mortgage bondholders of the Wabash Railway, consisting of Frederick N. Lawrence, Benjamin E Romaine and Edward Cotheut, urging the holders of the first-mortgage bonds to sign an agreement with the committee at the earliest possible date for the protection of their interests. The circular says: "The argument (in the Circuit Court at Chicago) developed the fact that the Purchasing Committee, in place of conforming to the decree for the sale of the Wabash property, by which they were required, as part of the terms of sale, to pay off and discharge the receivers' obligations, proposed to purchase these obligations to the amount of $4,000,000, and hold them with a view of litigating with the underlying mortgage bondholders as to their priority of lien. The further fact was developed that the Purchasing Committee have obtained an order from the United States Court at St. Louis, sanctioning such purchase of said obligations, and authorizing the receivers to pay such coupons as might be designated by the Purchasing Committee out of the earnings of the road. The avowed purpose of the Purchasing Committee is to use these two orders to the disadvantage of the bondholders who do not assent to the funding scheme. It is believed that these orders can both be set aside."

The Farmers' Loan & Trust Co., trustees of two of the Wabash first mortgages, is taking steps at the instance of the Lawrence Committee to have this order of Sept. 21 set aside.

Wallace & Northern.—This company has been organized at Spokane Falls, Wash., to build several short branch roads from Wallace, on the Northern Pacific, up the valleys of Cañon and Nine-Mile creeks, to various mines now in operation. Work on some of these branches is to be begun at once.

Washington & Elberton.—This company has been organized to build a railroad from Elberton, Ga., to Washington, the terminus of a branch of the Georgia Railroad. The distance is about 35 miles, through an excellent country and the road will pass near the Anthony Shoals, on Broad River, where there is a very large water power.

Washington, Ohio & Western.—This road has been leased to the Richmond & Danville Co., the lease to take effect Nov. 1. The road extends from Alexandria, Va., to Round Hill, 51 miles. An extension to Winchester is proposed. The Richmond & Danville has probably leased the road in order to prevent other parties from getting hold of it.

West Alabama Short Line.—This company has been incorporated to build a railroad from Akron, Ala., to a connection with the Sheffield & Birmingham road. Surveys for the line are to be begun at once.

Western Maryland.—The agreement under which this company becomes lessee and practically owner of the Baltimore & Harrisburg road was completed in Baltimore last week, as noted more in detail in another column.

West Jersey.—The statement for September and the nine months to Sept. 30 is as follows:

	September.		Nine months	
	18 6	1885	1886	1885.
Earnings	$133 725	$ 25,123	$1.077,139	$1.018,061
Expenses	77,376	87,109	658,292	624,168
Net earnings	$56.349	$38.014	$418,847	$39 ,893
Interest, rentals, etc			249,815	2 9 450
Surplus			$169 032	$ 54,443

For the nine months the gross earnings increased $59,078, or 5.8 per cent., and the expenses $34,124, or 5.5 per cent., leaving an increase in net earnings of $24,954, or 6.3 per cent. Fixed charges increased $10,365, or 4 3 per cent., leaving a gain of $14,589, or 9 4 per cent., in the surplus.

West Virginia.—This company, which was recently organized, is making arrangements to begin work on a railroad from Newburg, W. Va., on the Baltimore & Ohio, northward through Preston County, to the Pennsylvania state line, where it will connect with an extension of the Southwest Pennsylvania road. The new line will pass through a region abounding in coal, some of which is said to be excellent coking coal, of the same character as that mined in the Connellsville region in Pennsylvania. It will also pass

through several large tracts of lumber. It will be about 40 miles long.

Wichita Falls & Winfield.—This company has filed articles of incorporation in Texas to build a railroad from Wichita Falls northward to the Red River near the mouth of the Big Wichita. The line is intended to connect with a projected road from Winfield, Kan., south to the Red River.

Williamsport & North Branch.—This road is now completed to Nordmont, Pa., 6 miles northward from the late terminus at Sonestown and 28 miles from the connection with the Philadelphia & Reading at Hall. Trains are running to the new terminus. Work is to be continued to Bernice, 15 miles beyond Nordmont, where connection will be made with the State Line & Sullivan road.

ANNUAL REPORTS

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

Boston, Revere Beach & Lynn.

This company owns a line from East Boston to Lynn, Mass., 8.8 miles, and operates a ferry from the terminus to Boston. It is of 3 ft. gauge. The report is for the year ending Sept. 30.

The earnings for the year were as follows:

	1885-86	1884-85.	Inc. or Dec.	P. c.
Earnings	$222,845	$195,764	I. $27,081	13.8
Expenses.....	126 881	114,251	I. 12,630	11.1
Net earnings.....	$95 964	$81.513	I. $14 451	17 7
Gross earn. per mile ...	25,323	22.246	I. 3,077	13.8
Net " "	10,905	9,263	I 1.642	17.7
Per cent. of exps.... ...	56 9	58.3	D. 1 4	...

Interest and other charges amounted to $33.504, and dividends (6 per cent.) to $36,000; a total of $69,504, leaving a surplus balance of $26,460 for the year.

The statement shows a decided improvement upon the operations of the previous year. The number of passengers carried the past year was 2,020,640, an increase of 291,000 over 1884-85.

Grand Trunk.

The report of this company for the half-year ending June 30 last shows an increase of 6 miles in road worked, as follows: The Jacques Cartier Union Railway, included in the Grand Trunk system 6½ miles; additional lines at Sarnia Junction, Toronto Junction, and at Wiarton, 2 miles; together 8½ miles; less track removed at Lindsay Junction, 2½ miles; total increase, 6 miles.

The charges to capital account were £44,035. The principal item in that account is £25,458, being the amount expended to June 30, 1886, on the construction of the Jacques Cartier Union Railway, which, as stated in the report for December, 1885, it was decided to include in the Grand Trunk system. The account also includes £5,248 for 4 per cent. shares of the Chicago, Detroit & Canada Grand Trunk Junction Railroad Co. acquired; £1,900 for Wellington, Grey & Bruce bonds, acquired or exchanged; £5,488 for new works and other items.

The earnings for the half-year were as follows:

	1886	1885.	Inc. or Dec.	P.c.
Earnings	£1,557 041	£1 423,857	I. £.33,184	9.3
Expenses	1.097.714	1.090,737	I. 6 677	6 4
Net earnings... ..	£459 327	£333,120	I. £126.207	37.9
Per cent. of exps....	70.5	76 9	D. 6.1	...

Full repairs and renewals were made, the large net increase being due mainly to the maintenance of better rates on traffic.

The result of the half-year was as follows:

Net earnings, as above	£459 327
Interest, etc., received.....	35,306
Total.....	£494.633
Interest and rental.	414 263
Balance	£80,370
Sale of bonds, etc	48 518
Realized from North Shore Ry.....	26,0. 0
Total.....	£154,888
Debit balance, Jan. 1, 1886	1:9,604
Credit balance, July 1, 1886	£25.284

From this balance the directors recommend the payment of 1 per cent. for the half year on the 4 per cent. guaranteed stock.

The report gives the following statements:

"*Passenger Traffic.*—There was an increase of 172,817, or 8½ per cent., in the number of passengers carried during the June half-year of 1886, compared with the June half-year of 1885, while the increase of receipts was £8.580, or only 2 per cent. For the first three months the passenger traffic was extremely light, caused principally by the small pox epidemic at Montreal, which, the directors are glad to say, has entirely subsided. It was not possible, in consequence of competition, largely to increase the through passenger fares during the early part of the half year; but the local short distance and excursion traffic was so successfully developed during the later months, that while the revenue was thus somewhat increased, the number of passengers carried was greater than in any previous June half-year. Although the immigrant fares were, during the half-year, partially restored, yet it was not until July 1 that these fares were fully re-established. The number of passengers carried, and the average fare per passenger for the June half-years of 1886, 1885, 1884 and 1883 were:

	Passengers.	Average fare. s.	d.
June, 1886.....	2.207.3 5	4	0¼
" 1885.....	2.054,538	4	3¼
" 1884	2 1:8 909	4	10¾
" 1883.....	2.159 787	5	4

"*Freight Traffic*.—The freight and live stock traffic shows an increase in the June half-year of 1886, compared with the June half-year of 1885, of 120,110 tons, or 4.19 per cent.; and of £124,388, or 13 50 per cent. There was an increase in both local and through freight traffic, and for the last three months the rates on the through traffic were fairly maintained. The number of tons of freight and live stock carried during the half-year was the largest for any June half-year in the history of the company. The following statement shows the tonnage and the average rate per ton as compared with the corresponding half-years of 1885, 1884, and 1883, viz.:—

	Tons freight.	Average receipt. s.	d.
June, 1886	2,982,953	7	0¼
" 1885.....	2 862,843	6	5½
" 1884	2 873,383	7	1¼
" 1883	2.954,038	8	1

"*Conclusion.*—It is gratifying to the directors to be able to report, in conclusion, that the causes of depression on which it was necessary to dwell in the last half yearly report, have now in great part passed away. And it will be observed that as they have ceased to operate, so the traffic receipts have week by week shown corresponding increases. Great difficulties have, even in the course of the present year, been experienced in maintaining reasonable arrangements for securing remunerative fares and rates for passengers and freight amongst the various railway systems of the American continent. But material progress has been made, and the company's officers are constantly engaged in devising and promoting improvements in the general system of dividing traffic and of settling the difficulties and disputes that continually recur. Business appears to be reviving both in the United States and in Canada, and the harvest in the territory from which the company's traffic is drawn has been, on the whole, satisfactory. The price of wheat, however, still remains at a very low figure in Europe, and leaves but little margin of profit for its transportation from distant regions. Considering the general condition of affairs, the figures above quoted of the past half-year, taken together with the results, so far, of the current half-year, are, under all the circumstances of the case, of an encouraging nature; and the progress made by the company toward recovery from the calamitous and depressing effects of the working of 1885, has shown a recuperative power in the Grand Trunk system which cannot be deemed otherwise than reassuring and satisfactory. * *

"*Controlled Railways.*—The same causes which have led to an improvement in the working of the Grand Trunk system have also affected more or less favorably the half-year's operation of the Chicago & Grand Trunk, and the Detroit, Grand Haven & Milwaukee. The accounts of these lines are only finally adjusted at the end of each year, but the following statements show the estimated revenue results for the half year ended June 30, 1886, compared with those of the corresponding period of 1885."

CHICAGO & GRAND TRUNK.

The statement for the half-year is as follows:

	1886	1885.	Inc or Dec.	P. c.
Earnings.....	£290 273	£277,593	I. £17,680	6 5
Expenses	237,373	237,477	D. 104	...
Net earnings.....	£52,900	£35 116	I. £17.784	50.8

There is a debit balance to be carried forward to the accounts for December half-year of £36,853, as compared with a debit balance of £49,459 similarly carried forward from June 30, 1885, and £18,137 from June 30, 1884.

DETROIT, GRAND HAVEN & MILWAUKEE.

The statement for the half-year is as follows:

	1886	18 5	Increase.	P. c.
Earnings	£114,925	£101 973	£12 952	12.7
Expenses	87 576	81,966	5,6 0	6.8
Net earnings	£27,349	£20,007	£7,342	36.7

There is a debit balance of £5,897 to be carried forward to the accounts for the December half-year, as compared with the debit balance of £12,055 carried forward from June 30, 1885, and £5,998 from June 30, 1884.

Old Colony.

This company's lines cover the whole of Southeastern Massachusetts, and extend to the west and north of Boston as far as Fitchburg and Lowell. They are as follows:

	Miles.
Boston to Newport, R. I.....	67.79
South Braintree by Middleboro to Somerset Junction.....	37.60
South Braintree to Plymouth	25 94
Braintree by Cohasset to Kingston	32.36
Cape Cod Line, Middleboro to Provincetown.....	85.77
Nine short branches and connections.....	53 47
Northern Division:	
Fitchburg to New Bedford.....	91 02
Fair Haven to Tremont.....	15.17
Framingham to Lowell.....	26 12
Seven short branches and connections.....	19.14
Total owned	457 38
Fall River Railroad, leased.....	12.00
Total worked	469.38

The company also owns the Fall River, Warren & Providence road, 5.79 miles, worked separately; trains from its Fitchburg line run over the Boston & Albany track from South Framingham to Boston. It owns a controlling interest in the Old Colony Steamboat Co., whose lines run from Fall River and Newport to New York, and a large interest in the Nantucket & Cape Cod Steamboat Co. The report is for the year ending Sept. 30 last.

During the year stock was increased $200,000 by the sale of 2,000 shares for cash, as noted below: its amount is now $10.848,620. The bonded debt is $9,461,600, a net decrease of $11,700.

The earnings for the year were as follows:

	1885-86.	1884-85.	Increase.	P. c.
Passengers	$2,382,049	$2,229,961	$152,088	6 8
Freight	1 877.274	1,744,389	92 875	5.3
Mail, exp. and ex. baggage.	192,538	176,505	16,033	9.1
Rents, etc.....	96.181	80,331	15,850	19.8
Total...	$4,528.042	$4 251.186	$276,846	6.5
Expenses	2,945,104	2,970,130	254,974	8.6
Net earnings...	$1,302.928	$1,281,056	$21,872	1.7
Gross earn per mile.....	9.647	9,464	5'3	6 4
Net " " "	2 776	2.732	44	1 6
Per cent. of exps.....	71.2	69.9	1.3	....

The gross earnings of the company have exceeded by the sum of $276,846 those of 1885, before the largest in the history of the road. Expenses include taxes, which amounted to $234,397 last year, against $236,943 in the previous year.

The result of the year was as follows:

Net earnings from business...		$1,302,928
Interest accrued	$582,535	
Less interest and dividends received.....	89.933	
Balance of interest account	$492,602	
Track rentals.	32,094	
Dividends, 7 per cent.....	761,747	
		1,287.043
Surplus, credited to improvement account.....		$15,885

The balance of income for the year has been carried as heretofore to improvement account, and will be used to provide equipment and other improvements required for the increasing business. The balance to the credit of the surplus account on Sept. 30, 1886, viz., $762,516 will provide for the taxes to be paid to the state in November and in part for the dividend of Jan. 1, 1887.

The traffic for the year was as follows:

	1885-86.	1884-85.	Increase.	P.c.
Passenger train miles.	1,840,975	1,700.997	1.9.978	8.2
Freight " "	725,383	719.689	5.694	0.8
Total loco. miles	3,551 854	3 354.124	197.730	5.9
Passengers carried...	9,068,790	8 3'0,874	747 916	9.0
Passenger miles	134,813,164	124.174,681	10.638,483	8.6
Tons freight carried..	1,864,306	1 692,1 5	172,181	10.2
Ton-miles	63,360 258	60,134,191	3,226,067	5.3
Average train load:				
Passengers, No.....	73 2	73 1	0.1	0 1
Freight, tons	87.3	83.6	3.7	4.4

The average passenger journey last year was 14.87 miles; the average freight haul 33.99 miles. Locomotives ran 1.38 miles to each revenue train mile.

The equipment of the road has been quite largely increased during the past year: 7 locomotives, 22 passenger cars, 2 parlor cars, 3 baggage cars, 1 flat car, 1 caboose car, 2 derrick cars, 75 box cars and 51 dump cars have been built or purchased. A portion of this replaced cars and engines condemned, but most of it was additional, and increased the value and efficiency of the equipment.

During the year 4,273 tons of steel rails and 253,503 sleepers have been laid down, of which 1,101 tons of rails and 38,560 sleepers were used for the new second tracks. The new rails, weighing 67 pounds per yard, have been substituted for the lighter rails in the main tracks between Boston and Fall River, and the rails taken up, which were in perfectly good condition, have been laid upon those portions of the road where the traffic is lighter. The whole road has now been laid in steel except between Orleans and Provincetown, a distance of 25 miles. This track will be replaced with steel in the coming year.

The work on new station buildings has been continued; 16 iron bridges have been constructed in place of wooden bridges removed, and a number of grade crossings have been discontinued. The second track upon the Northern Division has been completed from Mansfield to Walpole Junction, and from Pratt's Junction to Fitchburg, and the most difficult part of the work upon the second track upon the South Shore Railroad, the removal of the ledges in Braintree and Weymouth, has been finished, and about five miles of this branch is now nearly ready to lay the rails. The cost of the work upon the second tracks during the year has been $323,294, which has been charged to construction account. Great improvements in grades and alignment have been made where the second track has been built.

The construction of the second track between Sherborn and Marlboro Junction was deferred on account of threatened disturbances in labor. The whole length of double track at present is 94 miles. The branch built to connect Brockton and South Abington has proved profitable to the company, and a great public convenience. A similar branch, about 6 miles in length, has been projected to connect Brockton and Easton, by way of West Bridgewater. Its probable cost will be about $150,000. The purchase of additional land at many places is noted, as is also, the intention of the company to remove its car-shops to South Braintree. The great flood of last February and the damage that it caused to the road is referred to, and it is stated that $94,644 has thus far been expended in repairing the loss then suffered.

The total charges to construction accounts were as follows:

Lands bought, less lands sold.....	$41,601
Shawmut and Brockton branches.....	772
Second tracks	323,295
Lowell & Framingham R. R	627.905
Total.....	$993,573

The consolidation with the Lowell & Framingham Railroad Co. was completed in April. The cost of the 26 miles of railroad with extensive depot lands in Lowell, under the

terms of union, was $627,905, by which amount the construction account has been increased. The property accounts have been, however, diminished by $434,017, the value of stock and bonds held by the company on Sept. 30, 1885, and used in the union.

Bonds to the amount of $56,000, bearing 5 per cent interest, due in 1891, were issued and exchanged for the 4½ per cent. bonds provided by the agreement of union. The premium on the latter, amounting to $2,800, was received by the company and is credited to the improvement account.

To provide in part means for the payment for new construction and improvements, 2,000 shares of new stock have been sold for the sum of $353,250. The premium, $153,250, has been credited to improvement account. The balance to the credit of this account, Sept. 30, 1886, was $197,203.

The New York business has been as large as in former years, and to provide for the prompt and efficient transportation of freight a new freight steamer, the "City of Brockton," has been placed upon the line by the Old Colony Steamboat Co. at a cost of about $225,000. The line is now fully equipped for both passenger and freight business. The Old Colony Steamboat Co. has purchased and canceled $150,000 of its bonds, payable in 1896, during the year.

Columbus & Rome.

This company owns a line from Columbus, Ga., to Greenville, 50 miles. The report presented at the recent annual meeting covers the operations of the road for the year ending Aug. 31, the first full year since its completion to Greenville.

The earnings for the year were as follows:

Earnings ($1,383 per mile)	$69,142
Expenses (94 9 per cent.)	65,481
Net earnings ($73 per mile)	$3,661

Expenses include $9,690 for improvements of track and bridges and $1,821 for new cars.

The President says: "The increase of expenditures is partly accounted for by the large amount of work done upon the road in the removal of trestles and bridge work and substituting therefor culverts and in filling the openings with earth, thus making permanent instead of temporary work. When the property came into your possession there was some apprehension felt as to the security of many of the trestles, and in view of the cost of the extension to Greenville but little more was done than to repair and make them temporarily secure. The period has now come when more attention is paid to the old portion of the road, and wherever brick and terra cotta water-ways can be used, they will be put in place of open trestles. This, in view of the broken character of the country, and of the number of these epen bridges, will, with our limited means, be the work of several years, and the true policy of the road will, in my opinion, be to spend every surplus dollar we may have in the improvement of the roadway and track. While the increase of earnings over the previous year has been gratifying, still they are far below the necessities of our road, and it is to be hoped there will be a still further improvement in this respect in the year we are just entering. Less than $2,000 per mile earnings cannot bring up and maintain the road at such a standard as will meet the requirements of the business public and this amount, unless rates are below a living point, we should expect from the character of the country and of the people from whom we derive our revenue."

Galveston, Harrisburg & San Antonio.

This company owns a line from Houston, Tex., to El Paso, 853.13 miles, with 83.48 miles of branches: 936.56 miles in all. There are 97.22 miles of sidings. The report is for the year ending Dec. 31.

From March 1, 1885, the road is leased to the Southern Pacific Co., the lessee paying all charges and 16½ per cent. of the net profit remaining after such payments.

The equipment includes 113 locomotives; 22 passenger, 9 sleeping, 2 parlor, 12 emigrant, 8 combination and 13 baggage, mail and express cars; 1,155 box, 207 stock, 379 box and stock, 1,093 flat and 43 caboose cars; 3 officers' cars and 107 service cars.

The general account is as follows, condensed:

Capital stock		$27,093,030
Funded debt		25,88 ,000
Texas state school fund loan		231,572
Sundry liabilities		1,464,209
Income account, balance		427,576
Total		$55,108,387
Road and equipment	$53,159,060	
Cash and sundry assets	1,227,842	
Bonds held	721,485	
		55,108.387

The bonds held include $365,000 Eastern Division seconds, $355,000 Western Division seconds, and $1,485 city and county bonds. The funded debt includes $4,756,000 first 6s and $1,000,000 second 7s, Eastern Division; $13,418,000 first-mortgage 5s and $6,709,000 second-mortgage 6s, Western Division.

The earnings for the year were as follows:

	1885.	1884.	Inc or Dec.	P.c
Earnings	$3 253 977	$2,9 -,590	I. $351,387	12.1
Expenses	1,704,970	1.979,760	D. 274,790	13.9
Net earnings	$1,549.007	$922 830	I. $626,177	67.8
Gross earn per mile	3 474	3,096	I. 375	12.1
Net " "	1,654	985	I. 669	67.8
Per cent of exps.	52.4	68.2	D. 15.8	....

Taxes, interest on bonds and on floating debt last year amounted to $1,480,365, leaving a net surplus of $68,641 for the year, against a deficit of $410,086 in the preceding year.

The income account for the year was as follows:

Earnings for two months		$451,772
Miscellaneous receipts		266
Rental from Southern Pacific Co., 10 months		189,324
Total		$641,362
Expenses, interest, etc., 2 months	$586 436	
Old claims, etc	40,078	
		626 514
Balance, surplus for the year		$14,848
Balance from previous year	$753,594	
Less back interest, loss on supplies, etc	330,866	
		422,728
Balance, Dec. 31, 1885		$437.576

The report says: "There has been no change in the position of our claim against the state of Texas for the lands we became entitled to by the construction of the Western Division, amounting to about 6,977,440 acres of land. As the many advantages accruing to the state at large, by the building of this road, are becoming more manifest with each passing month and appreciated by its citizens, we expect that the state will see the equity of our claim and grant the lands we have earned. In addition to these lands the company owns also 1,443,200 acres in various parts of the state, and town sites, lots and other valuable terminal real estate and land aggregating about 17,640 acres, all of which is constantly enhancing in value and which can be applied toward the reduction of its bonded debt."

Texas & New Orleans.

This company owns a line from Houston, Tex., to the Sabine River at Orange, 104.16 miles, with the Sabine Division, from Sabine Pass, Tex., to Rockland, 103.57 miles; a total of 207.73 miles. The report is for the year ending Dec. 31.

The road was leased to the Southern Pacific Co. from March 1, 1885, the lessee to pay all charges and 7½ per cent. on the net surplus received from the road.

The equipment includes 21 locomotives; 51 passenger, 3 sleeping and 2 baggage, mail and express cars; 162 box, 25 stock, 685 flat and 7 caboose cars; 1 road or service car.

The general account, condensed, is as follows:

Capital stock		$5,000,000
Funded debt		4,279 000
State school fund loan, 6 per cent		481,6 2
Sundry liabilities		539,990
Income account, balance		830,721
Total		$11,131,323
Road and equipment	$10 497.712	
Lands	162,592	
Cash and other assets	471 0 9	
		11.131.323

The funded debt includes $1,620,000 first-mortgage main line 7s; $2,075,000 first-mortgage Sabine Division 6s and $584,000 debenture 6s.

The earnings for the year were as follows:

Earnings ($4,899 per mile)	$1,017.618
Expenses (52.6 per cent.)	535,481
Net earnings ($2,321 per mile)	$482.137
Interest, taxes, etc	321.881
Surplus for the year	$160.256

This statement includes two months of operation by the company and ten months reported by the lessee.

The income account for the year is as follows:

Earnings of road, 2 months		$145,030
Miscellaneous receipts		7 304
Rental from Southern Pacific Co., 10 months		87,380
Total		$239,714
Expenses interest, etc., 2 months	$174 033	
Old claims, interest, etc	96,535	
		270,568
Deficit for the year		$30,854
Balance from previous year		861,575
Surplus, Dec. 31, 1885		$830.721

The company has state land grants amounting to 818,769 acres for the main line and 663,680 acres for the Sabine Division. An extension of the Sabine Division to Shreveport, La., is proposed.

Morgan's Louisiana & Texas.

This company owns a line from Algiers, La., to Cheneyville, 204 miles, with 54.5 miles of branches, and leases the use of the Texas & Pacific track from Cheneyville to Alexandria, 23.8 miles, a total of 282.3 miles of railroad. It also operates steamboat and steamship lines between New York and New Orleans, New Orleans and Texas ports and to other points. The report is for the year ending Dec. 31.

The property was leased to the Southern Pacific Co. from March 1, 1885, the lessee to pay all charges and 22½ per cent. of the net profits.

The railroad equipment includes 47 locomotives; 32 passenger, 6 sleeping, 3 combination and 12 baggage, mail and express cars; 798 box, 76 stock, 404 flat and 10 caboose cars; 52 service cars. The floating equipment includes 16 ocean steamers; 2 river steamers; 4 ferry boats; 10 steam tugs; 20 barges; 4 steam dredges; 2 steam derricks and 6 mud-scows.

The general account is as follows, condensed:

Capital stock		$5,000,000
Funded debt		6,728,716
Sundry liabilities		"2,173
Income account, balance		5,336,627
Total		$17,087,516
Road and other property	$14,165,712	
Cash, bills receivable, etc	2,921,804	
		17.087,516

The funded debt includes $5,000,000 first-mortgage 7s; $1,477,000 first-mortgage 6s and $251,716 old New Orleans, Opelousas & Great Western first-mortgage 8s.

The earnings of the company's transportation lines for the year were as follows:

	1885.	1884.	Inc. or Dec.	P c
Earnings	$4,232 018	$3 629,005	I. $603,012	16 6
Expenses	2,6 9 452	2,46 ,868	I. 163,584	6 6
Net earnings	$1,602,566	$1,163,137	I. $439,429	37
Per cent. of exps	62.1	67.9	D. 5.8	....

Charges on net earnings last year were: Rentals, $229,620; taxes, etc., $113,550; betterments and additions, $51,984; interest on bonds, $458,757; a total of $853,911, leaving a surplus of $748,655 for the year.

The income account for the year was as follows:

Earnings, 2 months		$67 ,958
Gulf, West Tex s & Pacific R. R		123 412
Miscellaneous receipts		79,416
Rental from Southern Pacific Co, 10 months		262,141
Total		$1,097,927
Expenses, interest, etc., 2 months	$659,550	
Miscellaneous expenses	75,768	
		735 318
Surplus for the year		$ 362 609
Balance from previous year		4,974,018
Total, Dec. 31, 1885		$5,336.627

Extensive improvements are reported on the road. The report says:

"During the year 81,135 cars were transferred across the Mississippi River at an average cost of 59 cents per car.

"This large amount of work was done without a single mishap, which remark will also apply to the entire line, where we have been practically exempt from accidents.

"The three new steamships, 'El Dorado,' 'El Paso' and 'Eureka,' chartered for service in the New York & New Orleans line, have in every way met the purposes for which they were acquired, and have added very materially to the company's revenues; so much so, and because of the increased traffic on this route, a similar and additional steamer has been arranged for to meet future requirements."

Kentucky Central.

This company operates a main line from Covington, Ky., to Livingston, 153.51 miles, with branches from Maysville to Paris, 49.33; Paris to Lexington, 19.17; Junction to Richmond, 31.26; a total of 253.27 miles, with 24.60 miles of sidings. The report is for the year ending Dec. 31.

Of the mileage worked 219.57 miles are owned and 33.70 (Richmond Branch and 2.44 miles main line) leased. Of the road owned all except 36.73 miles of the Maysville Branch is laid with steel rails.

The equipment includes 27 locomotives; 23 passenger, 1 chair, 2 combination, and 10 baggage, mail and express cars; 302 box, 5 refrigerator, 87 stock, 50 gondola, 142 flat and 14 caboose cars; 1 pay car, 1 derrick car and 1 tool car.

The general account, condensed, is as follows:

Capital stock		$5,466,300
Funded debt		6 C0 ,000
Accounts and balances payable		832 613
Income account, balance		6:9,435
Total		$13.528,4:8
Road and equipment	$12.993,943	
Supplies on hand	39,443	
Consolidated bonds unsold	342,000	
Accounts receivable	1 0 089	
Cash	32,953	
		13,528 428

The funded debt includes $2,000 old 7s; $119,000 Covington & Lexington 6s; $100,000 Covington & Lexington 5s and $6,379,000 consolidated bonds.

The earnings for the year were as follows:

	1885.	1884.	Inc or Dec.	P.c.
Freight	$484,950	$520,821	D. $35,871	6.9
Passengers	295,220	337,863	D. 42,643	12 6
Mail and express	59,754	57,116	I. 2,638	4.6
Miscellaneous	7,147	6,307	I. 840	1.3
Total	$847 071	$922 107	D. $75,036	8.1
Expenses	537.450	603,620	D. 66,170	10 9
Net earnings	$309,621	$318 487	D. $8,866	2.8
Gross earn. per mile	3,664	3,989	D. 325	8 1
Net " "	1.339	1 378	D. 39	2.8
Per cent of exps	6.35	65 5	D. 2 0	....

Charges, including interest on floating debt, amounted last year to $399,513, or $89,892 more than the net earnings.

A statement showing the total receipts and disbursements is as follows:

Net earnings, as above		$309 621
Decrease in assets		76,597
Increase in liabilities		108,174
Total		$494,392
Taxes, judgments, etc	$83,053	
Rental of leased lines	61,210	
Interest on bonded debt	255 750	
Construction and improvement	94,879	
		494,392

The coupons unpaid for the year amounted to $140,195. Of the construction expenditures $58,8C8 were on the Livingston Extension.

The traffic for the year was as follows:

	1885.	1884.	Inc. or Dec.	P c.
Passenger train miles	359.025	406 842	D. 47,817	11.8
Freight "	287,713	273 701	I. 14,012	5.1
Total locomotive miles	893. 60	9 9,31 2	D. 36 052	3.9
Passengers carried	4 8 601	4'8,857	D. 10, 56	2.4
Passenger miles	12,352.900	14 47 .859	D. 2,1 7.959	14.6
Tons freight carried	3 1,948	310,349	I. 1 599	3 4
Ton-miles	24,366,146	23,497,161	I 868,985	3 7
Average train load:				
Passengers No	31 6	35 6	D. 4 0	11.2
Freight, tons	84.7	85.8	D. 1.1	1.3
Average rate:				
Per passenge -mile	2 390 cts.	2.375 c's.	I. 0.0 5 ct.	2.4
Per ton-mile	1.991 "	2 217 "	D 0 226 "	10.2

Last year passenger-train cars ran 1,452,591 miles and freight cars 4,212,504 miles; 23.4 per cent. of the freight car mileage was of empty cars. The earnings per passenger train mile were 98.87; freight train mile, 168.51; average of all trains, 130.97; expenses, 82.82; net earnings, 48.15 cents. The average train was 4.05 passenger, or 14.31 freight cars. Locomotives ran 1.38 miles to each revenue train mile.

The average passenger journey was 29.51 miles; the average freight haul, 69.22 miles. Through freight furnished 47 per cent. of the ton-miles. The rate per ton-mile was: Through, 0.913; local, 3.661; coal, 3.319; average, 1.991 cents.

The President's report says: "An arrangement was made with the holders of the $220,000 Covington & Lexington 7 per cent. bonds, due on June 1, 1885, by which they were extended for a period of five years, with interest not exceeding 6 per cent. per annum.

"We have been unable to perfect suitable arrangements for crossing the Ohio River and for terminal facilities in Cincinnati, and this, together with the failure to secure the co-operation pledged by the lines formed to operate a new through line from Cincinnati to southeastern points and Florida *via* Livingston and Jellico (an essential measure to make the extension profitable), have arrested the development of the earning power of the road, and the earnings have in consequence fallen considerably below our expectations and the requirements of the fixed charges for the year, which have been, including $25,833 for taxes, and $13,200 for judgments chargeable to previous years' operation, $399,513, or $89,892 in excess of the surplus available for their payment."

Louisiana Western.

This company owns a line from Lafayette, La., to Orange, 112.03 miles; there are 12.73 miles of sidings. The report is for the year ending Dec. 31.

The road was leased to the Southern Pacific Co. from March 1, 1885, the lessee to pay all charges and 3½ per cent. of the net surplus.

The equipment consists of 9 locomotives; 4 passenger, 3 sleeping and 2 baggage cars; 122 box, 50 stock, 124 flat and 6 caboose cars; 1 service car.

The general account is as follows, condensed:

Capital stock		$3,360,000
Funded debt		2,240,000
Sundry liabilities		19,590
Income account, balance		292,359
Total		$5,911,949
Road and equipment	$5 637,935	
Cash and sundry assets	274,014	
		5,911,949

The earnings for the year were as follows:

	1885.	1884.	Inc. or Dec	P c.
Earnings	$6 7,316	$485,707	I. $141,609	29 1
Expenses	26 ,940	26 ,162	I. 17,778	6 6
Net earnings	$340,376	$216,545	I. $123 831	57 1
Gross earn. per mile	5,602	4 3 7	I. 1,265	29 1
Net " "	3,030	1,933	I. 1,106	57.1
Per cent. of exps	45.7	55 4	D. 9.7	..

Taxes and interest for last year amounted to $140,075, showing a surplus of $200,301 for the year.

The income account is as follows:

Earnings of road 2 months		$91,721
Rental from Southern Pacific Co, 10 months		38,806
Miscellaneous receipts		869
Total		$131,426
Expenses and interest, 2 months	$70,5 2	
Old claims settled, etc	10,925	
		81,477
Surplus for the year		$49,949
Balance from previous year		242,410
Total balance of income account		$292 359

So far this year the road has shown an increase in expenses and a decrease in net earnings, resulting from the continued low rates on the through traffic.